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THE
LOST
AMERICANS

THE LOST AMERICANS



FRANK C. HIBBEN

Illustrated by John De Grasse

THOMAS Y. CROWELL COMPANY

New York

TO MY WIFE

*Without whose assistance and encouragement
this book would never have been written*

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MANUFACTURED IN THE UNITED STATES OF AMERICA

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Preface

COLUMBUS WAS NOT THE first one to see these lands that we call America; nor, indeed, were those intrepid Vikings, who even earlier battled the North Atlantic seas to make a landfall on the rough Labrador coasts that they called Vineland. Nor were even the Indians. Human eyes had seen the shadowed mountains of this American continent long before the Santa Maria brought Columbus to the Caribbean. We are only beginning to suspect how many thousands of years ago that was.

The first authentic human being to leave his tracks in the mud of this world is a stranger to us. Indeed, until the late 1920's it was never even suspected that such a discoverer had been here at all. But a series of scientific accidents and discoveries have rolled back the mists of obscurity which covered these early beginnings. We now have incontrovertible proof that men lived here and hunted the mammoth and the mastodon in times that we can truly call ancient.

Antiquity itself is a magic word. Every visitor who watches an archaeologist exhuming a skeleton asks the inevitable question, "How old?" More than anything else

we wish to know our antecedents. Who were the first ones? And tumbling after this query, in a stream of human interest and enthusiasm, come the corollary questions, "What did they look like?" and "What happened to them?"

The question of the day is, "Who were the earliest Americans?" Scientists have assured us that man did not begin in North or South America. There is no need to search for the Garden of Eden in the jungles of the Amazon or the Everglades of Florida. All the signs point elsewhere. The Western Hemisphere is indeed a new world. The ancestors of the earliest Americans first began to reason and assert their superiority far from these shores. The story of the earliest Americans begins in Europe where not so long ago a number of unimportant people found some very important things.

ACKNOWLEDGMENTS

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CHAPTER I

The Beginnings of Man

IT WAS A BLUSTERY, COLD DAY even for the late fall; sheets of fine, misty rain drove over the low hills above the river. This part of northern France is miserable when the late rains blend with the cold of the coming winter, and this day was worse than most. In spite of the rain and the flurries of wind that swept the wet along the river road, an old man with a round hat stood with his face to the weather. The drops of cold water dripped unnoticed from his nose and the peak of his hat, and his shoes were sodden from the mud by the side of the road.

If you had braved the chill to look at this man on that momentous day, you would not have noticed the look of rapt attention on his face or perhaps even remarked that he scorned the weather; your attention, as his, would have been riveted on a jagged piece of flint which he held in his hand. He had just picked it out of a gravel bank where workmen had been repairing the road. The gaze of this man seemed to look at, and see through, this pointed piece of flint at the same time, as if it were a crystal ball of the past. He saw there men more ancient than anyone had supposed possible, and these men had killed animals now long extinct.

This man, with a vision that rolled back the years, was Boucher de Perthes, an unimportant tax collector in the town of Abbeville, France. It was in 1830 that Boucher de Perthes picked a flint fist axe out of the gravel of the Somme River, in northern France, and began a long series of discoveries of the ancestors of man. It was not so much that he found this fragment of flint which was obviously worked by the hand of man, but the remarkable thing was that he recognized its importance.

It is indicative that twenty years passed after the original discovery before there was any public acceptance of Boucher de Perthes' theory of the existence of prehistoric men. Even then, the admission that there had been such ancient men was exceedingly grudging and confined only to scientific circles.

The year 1830 is but yesterday in history. The Revolutionary War was already a thing of the past by that date,

and yet the whole story of the beginning of man was absolutely unsuspected previous to that time. It is entirely just and fitting that we begin the tale of the earliest Americans with the discovery of Boucher de Perthes; for, without his steadfast belief that extremely ancient men had made and used the flint fist axes that he found in his gravel pits, the story of the earliest Americans might never have been told.

The piece of flint which the Frenchman picked so carefully from the wet gravel of the river terrace on that day was not a beautiful thing. It was a flint pebble that had been chipped to a rough point on one end. If the rounded end had been held in the palm of the hand, the jagged point could have been used for hacking or cutting, like the huge claw of an animal. For this reason it was called a "fist axe." We can easily imagine Boucher de Perthes hefting his first find in his hand and visualizing the hairy fist that had fashioned that flint so long ago on that same river bank.

The fist axe was crude indeed, so much so that many a road worker had thrown fist axes into the maw of the gravel crusher without noticing any difference in those particular pieces of flint. No wooden handle was ever used on this implement. The shock of the impact of the weapon was absorbed in the calloused palm. The chips necessary for making a fist axe are few and comparatively crude. Anyone with a piece of flint of adequate size can make one in ten minutes. But the idea behind it was momentous. Without actually knowing it at the time, Boucher de Perthes had found the first known kind of implement made by man.

From that same rain-soaked gravel, this scholar of a century ago also plucked the encrusted bones of several large animals. These were not the horse and cow bones which could be found around the French villages along the river. These remains were of elephants and rhinoceroses. It had been many thousands of years since these animals had trumpeted and fed in the valleys of France.

Boucher de Perthes also initiated the archaeological method for determining the age of these finds. He found bones of extinct animals mingled in river gravels at considerable depths from the surface. Interspersed with these remains were flint axes purposely chipped into shape. It was not difficult to suppose that ancient men had seen these same animals and had killed them with these same puny flint points; nor did it need the weathered and patinated appearance of the flints to indicate that these men had fashioned the axes a very long time ago.

The very paucity of the objects that were recovered from the gravels of France argues volumes in itself. The rough, pointed fist axes were not accompanied by any complex of stone and bone implements such as later so-called "primitive cultures" used. It took no great imagination to envision a man who threaded his way among the great animal herds of northern Europe armed only with a piece of flint in his hand. He wore no clothes, as there is no evidence that he prepared the skins of the animals which he killed for food. This remote human being was possessed of only two things, namely: reason and the first tool which

that reason had taught him to make. Ancient man was clever enough to notice that this one variety of rock—flint—broke with a razor-sharp cutting edge. This reason led him to discover that he could, with ingenuity, artificially shape a piece of this flint to just the right point for his axes. He must have noticed that the great animals around him had long tusks and canine teeth and claws. Why not a flint point to even the odds?

Boucher de Perthes found no human bones in his gravel pits. Indeed, it is one of the consuming mysteries of our early beginnings that so few fragments of human bone can be definitely associated with fist-axe tools. There are at present several kinds of fossil humans who are candidates for this honor. Thousands of fist axes now line museum shelves, but the men who made them are still only vaguely known figures. There are, indeed, indications that men even earlier than the fist-axe people picked up odd bits of stone and used them as they found them. This "dawn period," when men merely used what they could find between their feet when the need arose, is almost too ancient to contemplate. Whatever our nebulous beginnings, however, the fist-axe era stands as the foundation of all our later historical calculations. Even though we cannot point at any one skull packed in museum cotton and glibly say, "This was the man who made the famous fist axe and the brain which was in this skull case conceived the first tool," even though we know these first men only by their tools, they are real men nevertheless.

Along with the fist axes and the fossilized mammal bones was other information which the average man might pass by unnoticed. These lost pages of history lay in the gravels themselves. How could these implements lie so deep in these laminated sands and gravels? Many of these sites lay many feet above the high-water mark of the river today. Fist axes were found at depths of fifty feet in these deposits on the shoulder of the valley. What catastrophic maelstrom could bury them so deep?

Scientists and scholars did not seek long to find the answer. The great continental ice masses that swept over Europe many thousands of years ago caused profound changes in the streams and valleys as the walls of ice advanced and retreated. Four times the ice caps collected in the Alpine region of Europe, and four times they crept out over the surrounding portions of the continent in tongues and ice cliffs of astronomical proportions. The gravel terraces of the river valleys were formed at this time. The glacial advances were named and the river terraces that corresponded to each were likewise designated.

By careful correlation of this information, it was found that the fist-axe men lived roughly between the second and third of these great glacial periods. It took thousands of years for this ice to collect, and equal millennia for it to advance and retreat. Thus geologists constructed a great chronological hatrack on which to hang our knowledge of man. But each prong of that rack is a thousand years.

Geologists tell us that the fist-axe men traveled the valleys of northern France some 500,000 years ago.

The findings in the wet gravel pits of Boucher de Perthes initiated a whole chain of discoveries which were, in the last half of the nineteenth century, to culminate in a body of knowledge almost unbelievable in its implications. As European scientists, Englishmen with their monocles, Frenchmen with their canes and tall hats, and Germans with their mustaches and goatees gathered in scientific groups, more and more the talk was of the early history of the human race. This was a time when man began to discover himself; it was as though the topmost branches of a mighty oak had suddenly become aware of its trunk, whose existence it had not heretofore suspected.

As late as the time of the Civil War, and both in the United States and Europe, scientific thought of all categories was confined by Biblical ideas of the origin and extent of man's history. From Genesis, it was argued, man's whole story could be told in six thousand short man-made years. The growing certainty that man's history extended many thousands of years earlier than this made a more liberal interpretation a necessity.

At about the same time, in the 1860's, there was an enlightenment of thought along religious as well as scientific lines. As important as the Industrial Revolution was the loosening of the strictures of exact religious interpretation. One of the greatest discoveries that was made by many

men, not by one alone, was that science was not antagonistic to religion but actually corroborated it. The beginnings of the Biblical stories of the creation of man could be interpreted in a scientific sense, as well as a medieval, scriptural one.

Archaeologists and historians found that much of the Old Testament especially was extremely old—far more ancient than had been originally supposed by the Christians of the early centuries of Christianity. The discovery of the Dead Sea Scrolls in 1947 and in the succeeding ten years has pushed the antiquity of portions of the Bible even farther into the past and amplified our knowledge of how those parts developed into the Bible as we know it today.

There are actually two versions of the Genesis, the second story far older than the first, and both part of the religious lore of peoples who preceded the Israelites by hundreds, if not thousands, of years. The Tower of Babel is a Babylonian story. The account of Moses in the bull-rushes is also an old Mesopotamian theme. Scientific excavation and study have provided us with this information. It was an archaeologist who dug up the corroborative evidence of the great Flood. There is no wonder described in the early pages of the Old Testament more inspiring than the story of the development of mankind as it is revealed in the actual tangible discoveries of flint and bones.

And so, in the last half of the nineteenth century, scientific thought and progress began to probe the avenues back into the millennia before the Roman Empire. Discoveries

began to sparkle out over Europe like lamps in the windows of a deserted city. Not only flint implements and evidences of the handiwork of men began to come to light, but also the remains of men themselves. A skull was found on the rock of Gibraltar; some workmen found a human skeleton in a cave near Düsseldorf in Germany; other human skeletons turned up in caves in central and southern France. England contributed also, and some of the most notable discoveries were made accidentally or by purposeful digging along the chalk cliffs of the channel coast and in the central and southern portions of England.

From our scientific study of the bony structure of the animal, man, we can, with certainty, even from an incomplete skull, tell the contours of the face, the capacity of the brain, and many other features which go to make up the man. From a shattered leg bone, the manner of walking of the original owner is indicated. The skeletons of the dead do tell tales. The beginnings of man are told not only in the development of his instruments but also by the development in man himself.

It took no scientific man to notice that the human skull that the workmen had accidentally shoveled from the cave in the gorge of Neanderthal near Düsseldorf was no ordinary human skull. The bony ridges above the eye sockets of this remarkable man were protruding and heavy; the vault of the head was low and peaked like the roof of a house; the attachments for the neck were far back like those of a gorilla. Even to a layman, the man of Neanderthal was

obviously a remarkable human, a beetle-browed, big-toothed, stoop-shouldered, shuffle-gaited fellow. And the flint tools that were found with this man were developments and refinements of fist axes, with the addition of flint flakes used as skin scrapers. It seemed that the Neanderthal man himself was also an extinct variety. No one with those features could pass a city gate anywhere in Europe and go unnoticed.

Some scientists argued that Neanderthal men were so primitive and so low in the succession of fossil types that they represented an offshoot from the main stem of human development. They were extinct. Other savants believed that they saw some Neanderthaloid characteristics in modern and semimodern people. Whether Neanderthal blood actually flows in our own veins today is still a moot question. However, no one can deny that the Neanderthals of Europe and Asia were actually men. They hunted together; they had family life and undoubtedly a language of sorts. They possibly even had the beginnings of religion; for they, at least occasionally, buried their dead accompanied by offerings as though for an afterlife.

In the times that we call the "Gay Nineties" on the Bowery, the tracks and traces of the earliest men were forming themselves into a picture that was becoming clear to learned and laymen alike. The man on the street spoke glibly of the first "cavemen," and peasants and farmers reported their important finds as soon as the plow revealed them.

Some quarrymen, in what is now Yugoslavia, found some Neanderthal-type bones in a cave revealed by their rock blasting. These human bones showed evidence of having had the flesh removed and the cylindrical part of the limb bones cracked for the marrow as though they represented the remains of a meal. Some other men had killed and eaten Neanderthal men here the same as they had the other extinct animals of the period. These other hunters or cannibals were probably Cro-Magnon men, so named from the place where the first skeleton was found at Cro-Magnon, France.

The Cro-Magnons were a tall, more clean-limbed race of people and certainly more attractive by our own standards than some of the earlier fossil men. A Cro-Magnon woman, dressed in modern fashion and with a few cosmetics of the day, would pass muster in any Washington social gathering. The people of the Cro-Magnon variety apparently roamed and hunted over a considerable portion of Europe and also portions of Asia and North Africa. Numerically, they were far more impressive than their predecessors, the Neanderthals. We can describe them as groups of nomads all springing from a common or similar stock.

There is considerable evidence that the Cro-Magnons were derived from a mixture of other fossil men, some of them as yet undiscovered. They seem to represent a mixture of strains, possibly even including Neanderthals. Some Europeans believe that the Cro-Magnons killed off the Neanderthals, supplanting them and taking over their hunt-

ing grounds. In the process, the Cro-Magnons undoubtedly carried off Neanderthal women as mates. At all events, it would seem that the Cro-Magnons were the first real Europeans in the sense that they embodied in their make-up several strains of human stock. Although they are overlaid, at the present time, by varieties of humans that originated in the recesses of Asia and Africa, there is no doubt that the Cro-Magnon line represents a very considerable portion of modern European blood.

Albeit the Cro-Magnons were less "beetle-browed" than the Neanderthals, they were "fossil men" nevertheless and were another hallmark in the progress of man. Caves and open camp sites where Cro-Magnon men hunted and slept and died could be recognized at a glance. Just as Louis XIV furniture may be recognized by the expert as representative of the period that made it, the flint tools of these early fossil men are distinctive. Here is a scraper typical of those of Neanderthal men, and above it in the pile of debris lies a beautiful spear point made by Cro-Magnon men. "By their works ye shall know them," even if those works are only stone weapons. It has been said that nine-tenths of the history of man has been written in flint. Is it strange that we wish to read this writing?

With the discovery of more and more fossil men of various types, it was becoming apparent that the human animal had passed through a number of stages of development. In 1859 Charles Darwin wrote his momentous book, *The Origin of Species*. This pointed out that man as a physi-

cal being had progressed through a series of physical changes extending over a very long period of time. The idea aroused a storm of protest. People argued in the horsecars and over the tea tables that it was preposterous that we descended from apes. Charles Darwin argued, somewhat futilely, that he had not claimed that anyone was descended from an ape, but merely that man had gone through a long series of physical changes in his development. The argument waged warm and on more than one occasion became acrimonious debate. Even scientists were ranged against their own kind on one side or the other.

Whatever stand one might take in this matter, there was no doubt of one thing: the history of man went back a very long way. Also in the antiquity of man there were way marks in the form of various kinds of "fossil men." Neanderthal man was merely one of these stages in the development of mankind. Cro-Magnon man was another fossil type indicating a further advanced stage of development.

Generally speaking, the more primitively formed fossil men were the earlier. The progression was by various stages, from the extremely rudimentary types, such as Neanderthal man, to the modern human as we see him on the street today. We have fossil men as examples of about every stage in that development. The story of man is both the story of his physical development as we find him in the bony skeleton and also the story of the increase in his brain capacity from the small-skulled beginning to the modern high-brow. Whatever our exact final decisions on our early ancestors

may be, however, there is no doubt that Europe saw some of the earliest beginnings of man and considerable strides in their development.

We do not need, however, to confine ourselves to Europe in discovering the roots of our past. The finding of fossil men in the more populated areas of England, France, and Germany stimulated discoveries in other spots. The famous *Pithecanthropus erectus*, or Java ape man, was discovered by a Dutch surgeon in the East Indies. A notable skull was found in Rhodesia, Africa; China gave the world a series of discoveries, just prior to the First World War, involving types of fossil men and implements distinctive of their kind. The Peking man, found near Chicken Bone Hill in northern China, is now one of our most notable fossil finds.

Neanderthal skeletal remains began to turn up in Palestine, Russia, and even central Siberia. Typical Neanderthal implements weathered out of the loess hills of China and Mongolia.

The pointed pieces of flint, which Boucher de Perthes had identified as the earliest tools of man, now began to turn up in such out-of-the-way places as South Africa, North Africa, Egypt, and India. It seemed that the earliest men had left their fingerprints all over the Old World even though the flesh has long since rotted from those gnarled fingers and the bones disappeared as well.

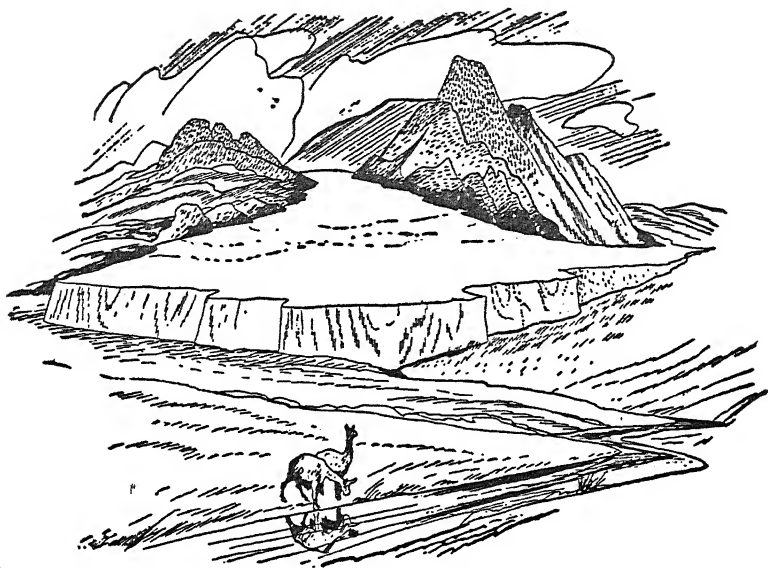
It is indicative that as late as 1912 a society was formed in England for the discovery of the location of the Garden of Eden. Basing its conclusions on Biblical evidence as well

as on the scientific finds of the day, this august body, probably rightly, concluded that the Garden of Eden lay somewhere near the area now called Mesopotamia. In that region in the last few years a woman scientist from the University of Cambridge has uncovered skeletal remains of Neanderthal man. Flint points and scrapers glitter in the sun in the wadies and gullies of Palestine. There is little doubt that the Holy Land is close to the center of the development of man, even though we have only scattered pieces of the picture puzzle at the present time. In spite of gaps, however, the story of man's beginnings is, in the main, quite lucid, and all of it centers around the Old World.

In the caves and gullies of Europe, Africa, and Asia our ancient ancestors buried their dead and left the greasy bones of their animal kills. Thousands upon thousands of years are represented in the piles of debris and implements that these men left behind them. Whereas we may develop a new and praiseworthy method of killing one another in just a few years, those ancient fossil men spent centuries in simply perfecting a crude flint point with which to hack the tough hide of a mammoth. The wheels of the earliest beginnings of man ground out the grist of progress with exceeding slowness. In actual time, over seven-eighths of the entire history of man lies within this "fossil" period.

If we must, then, emblazon our coat of arms with a fist axe on each side and a Neanderthal skull on a European field, what of the New World? Did any primitive human sit on the gravel terraces of the Hudson River and hack out fist

axes at the same time? Did Neanderthal man lair in the caves of Missouri or hunt in the valleys of Ecuador? What of New World fossil men and their flint weapons? Who was the earliest American?



CHAPTER 2

How Old Is Man in America?

IF YOU HAD ASKED ANY MUSEUM guide in 1925 when man first came to North or South America, he undoubtedly would have answered: "About the time of Christ, or slightly before."

Undoubtedly also you would have joined in the protest, "But what of the ancient Mayas of Yucatan and the Incas of Peru, are not these as ancient as the people of the Old World? Weren't the Aztec cities built at the same time as Rome?"

Antiquity, like women's hats, goes by vogue. When the

first European settlers began to spread over the North American continent, and even in the time of the Spanish Conquistadores in their inroads into Mexico and Peru, the Europeans were struck by the impact of the ancient civilization that they saw before them. As they tracked through the matted jungles of Mexico in search of more and more gold, as they plodded north over the burning sands of the Southwest following the chimera of the "Seven Cities of Cibola," everywhere they found Indian tribes, well established, living obviously with precedents going back many centuries. In such places as the Valley of Mexico they found well-ordered cities such as the fabulous capital of Montezuma, the city of Tenochtitlan, which even Cortez said rivaled the splendor and size of Venice. This city gave a remarkable impression of age, of something that had been long established. If the Spaniards were in any doubt about this, it was dispelled when the Aztecs told them that their city and their culture had been founded upon a much older one which they had discovered in the Valley of Mexico when they had arrived.

The European whites, threading their way over the Appalachian highlands in the days around the turn of the nineteenth century, found throughout the valleys and tributaries of the Mississippi and other southern rivers thousands of earthen mounds, some of them of tremendous size. The modern Indians, whom they found in their villages strung along the same streams and who hunted the same forests, disclaimed any knowledge of these mounds. The modern

tribes in every case attributed these great earthworks to the "ancients." It did, indeed, appear as though an extremely early people had built the mounds of North America. These mysterious and long-forgotten people were called "Mound Builders" and up to the time of the Civil War were thought to be extremely ancient. Even Thomas Jefferson became interested in the problem of antiquity and excavated a mound which he found on his farm in Virginia. Although the few scattered mounds in the Virginia area are on the extreme edge of the mound-building region as a whole, this mound, as others, gave an impression of great antiquity, of persons who had long been dead and whose very existence had been forgotten.

The fervor of antiquity which spread over Europe at about the time of the American Civil War touched, with its infection, American thought. In books of the day, the Mound Builders and the Aztecs were ascribed antiquities of from twenty thousand to a million years. As the Mayan cities of Central America gradually became known to early travelers of this time, the mysterious stone buildings, crumbling in the midst of enveloping jungle trees, merely heightened the illusion. One of the favorite explanations of Civil War times was that these ancients were the descendants of the "Seven Lost Tribes of Israel."

The Indians, that is, the modern Indians whom the whites found when they came to the New World, were regarded as recent upstarts. They were thought of as being of a different era when compared with the "ancients." After all,

these modern red-skinned natives seemed to have forgotten much of the lore of the earlier civilizations. Whole cities were so old that their very existence had been forgotten in the depths of jungle wildernesses.

A favorite pastime of this romantic era was the comparison of the ancient Mayans with the tombs of Egypt which were just then beginning to be a real study in European circles. A few European scholars even went so far as to come to the New World to study similarities among the ruins of Egypt, Persia, Mesopotamia, and those in the New World. Many a long-bearded scientist lived to regret that he went so far as to publish his theory that such a connection existed.

As the Europeans spread throughout the new lands which they found lying fallow in these continents, everywhere they found aborigines. Not just the favorable spots where the game was thick or the climate agreeable were inhabited, but all parts of the land were occupied, as well as adjacent islands offshore. The Ona and the Yahgan of the extreme southern tip of Tierra del Fuego eked out a cold and misty living hunting the wild guanaco. The Eskimo in the far north, with admirable ingenuity, had adapted himself to a dependency on the flesh of sea mammals under almost insurmountable climatic conditions. The Pueblos of the Southwest developed an agricultural economy in an almost totally arid region. Steaming jungles of the Amazon supported other tribes equally at home in these inimical places. All of this had not been done in a few short centuries. Many

a weary year was needed for these many peoples to wander into all corners of the New World and establish their divergent ways of life.

The native American Indians are noteworthy in other respects. There are in North and South America some three hundred separate and distinct linguistic stocks. Linguists are now amalgamating these basic languages into a lesser number, but the total is still very great. These mother tongues or families are in turn divided into separate languages and dialects. Such a diversity gives a remarkable impression of age. How long would it require for two neighboring tribes to develop languages that were mutually unintelligible and completely different in structure?

The very differences in the Indians themselves seems indicative of very ancient beginnings. Short and tall, black to almost white, the American Indian ran the whole gamut of body form, facial features, and skin coloring. How long would it take for these differences to develop from some common beginnings?

With the diversity and variations in speech and body which the Europeans found among the aboriginal inhabitants, is it any wonder that they thought of these beginnings in thousands of years? These are muddy and intangible conclusions at best, but a certain conviction that it all began a very long time ago was certainly justified. But by what calendar are we to measure changes in savage men?

Around 1900 a new turn of events came to pass. There was a change in vogue of antiquity. It was the era of de-

bunking. Obviously, some of the estimates of the antiquity of the civilization of the New World had been in error. So far were they in error that the discrepancies were sticking out like broken bones. At this time certain of the first real investigations were made in the New World ruins. It was a time when scientists first began to excavate the mounds of the Mound Builders with some idea of what they were trying to find. Previously most of the excavating was done by farmer boys on quiet Saturday afternoons. The first serious expeditions began to study the Mayan and the Peruvian ruins in an objective light, unblinded by any romantic aura which might have lingered over from a previous age.

Undoubtedly the greatest aid to the actual dating of the prehistory of the New World was given by Dr. A. E. Douglass of Arizona, when he worked out a system for the dating of ancient ruins by the study of tree rings. This science, known as "dendrochronology," arose from Dr. Douglass' study and interest in the relation between sun-spots and tree growth. In these studies, this intrepid investigator discovered that the tree rings in certain areas faithfully reflected a sequence of events caused by the wetness or dryness of the various years during which a tree had grown. For example, every tree in a certain district would have three narrow rings reflecting a three-year drought a century ago. Following these three narrow rings, there would be one broad ring representing the good year that followed, when plenty of moisture allowed the tree to grow a full, heavy ring.

By such observations, Dr. Douglass and his assistants built up a chart which, by overlapping trees, extended back into antiquity with a true graph of the sequence of seasons throughout the various centuries. Any piece of ancient wood, recovered in charcoal or actual form, from prehistoric ruins may be charted in the same way. As the chart for the ancient wood specimen is compared with the master chart made up by Dr. Douglass, the exact year in which the ancient piece of wood was cut may be ascertained.

This tree-ring calendar was a tremendous step in studies of the antiquity of the New World. It reduced guesswork and hypothesis to exactitude. The results were astounding. In spite of the fact that the tree-ring master calendar has been carried back by overlapping specimens to the time of Christ, most of the dates procured in the southwestern portion of the United States fell around A.D. 1000. This, by European standards, is practically yesterday. The battle of Hastings in 1066 was fought by Europeans participating in written history, led by men whom we know by name and who had religious and governmental policies which were modern by comparison. On the other hand, these Pueblo ruins which Dr. Douglass had dated so exactly were peopled by strangers whose names have long sunk into oblivion, whose practices and antecedents and connections are remarkably obscure. In short, the New World was far behind the Old World in development.

The Mound Building People of the Mississippi Valley were found, by the tree ring method, to have reached their

peak around A.D. 1000. Mayans of Guatemala and the Yucatan had evolved a complicated calendar which they often carved on buildings and stone monuments. The early Mexicans also used a version of this calendar. Archaeologists were thus able to determine when these buildings had been built, and though there were difficulties correlating these ancient calendars with our own, it became obvious that the ruins had been built *after* the birth of Christ.

By no stretch of the imagination could any of the antecedents of these civilizations of the New World be dated back much before the time of Christ. Even with a comfortable thousand years thrown in, we could not get our first squalid beginnings back far enough to correspond to the beginnings of Egypt or even Greece. The mysterious mounds of the eastern United States had been built only about a thousand years ago. Indeed, evidence was secured that some few tribes had constructed mounds up to and including historic times. The Mayan ruins in the mysterious jungle depths were not thousands of years old but only hundreds. All the civilizations of Peru, with their stone architecture and brilliant textiles and pottery, had developed and flourished during the Christian era. This was disappointing but unequivocal.

In 1925 any archaeologist, or your favorite lecturer from the platform, would have told you the same thing—that the very beginnings of human life in the New World could not be regarded as really ancient. In other words, when the

Holy Land had already seen ages go by, the New World was just on the threshold of life. From this viewpoint, the continents of North and South America were a New World indeed.

Merely bringing all the dates of our glorious antiquity tumbling down into the millennium following Christ was not a solution to the great questions concerning our past. There were many such questions, even in the blooming years of the 1920's. There was one consideration that gave encouragement to those who still searched for a greater American antiquity. This was a question of a plant, a humble plant, but nonetheless an important one. This plant was maize, or as we call it in the European manner, corn.

When the European explorers splashed ashore on the beaches of the New World, they found Indian tribes of every conceivable linguistic variation and mode of life; and these red savages, whether primitive or semicivilized, were growing a plant absolutely new to the Europeans. Cortez, avaricious as he was for golden gain, recognized the value of the new plant. Indian corn was raised by the primitive inhabitants of the New World from Canada, south through what is now the United States and Mexico, down to and including considerable portions of northern and central South America.

The plant, corn, was more than just another plant. This food, so much more dependable than shifting herds of **animals**, made existence more certain. It also produced an

incentive for sedentary life, which is tantamount to saying the beginnings of true culture. An agricultural basis is the foundation of what we call "civilization." Corn, along with two other New World products, beans and squash, was the reason that the Mound Builders built mounds and the Mayans raised the stone temples and steles in Yucatan. The beginnings of agriculture were the beginnings of real life in the Americas. Perhaps we can get a clue to the first beginnings from this fact itself.

Nor was the fact that corn lay as the basis of New World civilizations its only importance. This peculiar plant has been long cultivated in the Americas, so long that its origins also reach back into that darkness which we are trying to illuminate.

Corn, as we know it, was already highly developed by the Indians when the Europeans first found them. Hundreds of varieties, ranging from popcorn through the gamut of sweet corn, field corn, and flint corn, were all known to the primitive Redmen. They had developed varieties that would grow in the short summers of Maine and other kinds that would survive the droughts and the scanty rainfall of northern Mexico. How long did it take these Indians, who were ignorant of botany, to develop these strains?

Then, too, a peculiarity is inherent in the corn plant itself. It could not exist without the hand of man! Uncultivated and untended by humans, the corn plant has no way of dispersing its seeds. If the cobs drop at the foot of the stalk, the next year the young plants sprout so thickly there that they

will not bear ears and soon will die out. There is no such thing as wild corn! Botanists have pointed out that even with purposeful development, it would take a very long time to develop the plant to its present status. It has been estimated that it would require twenty thousand years to develop this plant, maize, from a primitive seed-bearing grass, which was its probable origin, to the corn-on-the-cob that we know today. But twenty thousand years does not fit in with our ideas of antiquity based upon recent dating. Shall we presuppose some primitive, extremely ancient Burbank, who conceived the idea of developing some seeds on a grass which he had found growing wild, so as to increase their size? The idea seems preposterous; and yet, how did maize develop?

The vague indications of the possible antiquity of corn in the New World are disturbing but not conclusive. All other evidences point to an agricultural status of post-Christian date for these fair lands. It is intriguing but useless to speculate upon the sights you might have seen if you had stalked the Kansas plain in the year one.

It is no wonder then that in 1925 most careful scientists were convinced that the New World was a group of verdant, upstart civilizations that had sprouted from the Old World beginnings, well after the latter had been fully developed. Vague indications of extreme antiquity such as the beginnings of agriculture were shadowy fingers with not enough substance to point to any real fact. Lecturers from the platforms of Harvard and Yale of this time were glib

in their pronouncements that this had been a virgin land shortly before the time of Christ. It was a land ready for man, ready for his reasoning powers, ready for his organizing and development, but it had not yet known him.

After two centuries of cultivation of the land, no American farmer's plow had turned up a fist axe in his furrow. Indeed, old Dr. W. H. Holmes of the National Museum thought he had found fist axes in the neighboring state of Maryland. These were proved, however, to be but rough rejects from a dump pile where recent Indians had been chipping flint arrowheads. Dr. Holmes had been too long in Europe, his colleagues whispered behind their hands. Any fool knows there is nothing comparable to early European flint work here. This is a *new* world.

No Neanderthal skull was forthcoming from the caverns of Virginia or Kentucky. Even the more modern-looking Cro-Magnon was absent. No American counterpart of Peking Man or the Java ape man turned up to salvage the reputation of the new continents. A skull from Calaveras County, California, a skeleton from New Orleans, a skull from Ecuador were proffered as New World fossil men. Each was a disappointment, as it showed no primitive features which anthropologists had come to expect in these earliest humans. Several very suggestive skulls came to light in Texas and New Mexico, but each of these was found to be essentially modern and did not score as a fossil man. Apparently, there were no "beetle brows" in early America.

Our glacial gravels were sterile of chipped flint. Un-

doubtedly many a Boucher de Perthes fingered the American glacial deposits and found nothing therein to excite his curiosity or to preserve his name for posterity.

It would seem, then, that the archaeological prospects of North and South America were third rate indeed. If we had no real fossil men on these continents to show as our earliest ancestors, we could be only the newly begotten stepchildren of Europe and Asia, those venerable foster parents. We couldn't even produce early flint fist axes in our river gravels to counter those of Europe and Africa. It was hard to accept but true. The first real men walked the gravel bars of the Somme River 500,000 years ago. By these considerations, the first American walked in the Mississippi mud some 497,000 years later than that.

Like a fever chart, our ideas of antiquity went up and down during America's growing years. But in 1925, in the center of an era which was truly scientific, our antiquity was at an all-time low. Unfortunately, science was not to be denied. There were the tree-ring dates. Rome had already fallen when most of the American civilizations were not yet begun. You have seen the indisputable facts. In 1925 you also would have said that the earliest American came but yesterday to these shores.

We would have derided any visionary who claimed that human beings ranged the Missouri Valley when the mammoth and the saber-toothed tiger yet lived there. With no fist axes and no fossil men, what part did America have in these things? The mammoth was here, yes, and many

another great mammal of a forgotten era, but were humans here also? Did human eyes see the animals whose bones were matted in the oozing tar pits of La Brea near Los Angeles? If so, where were the flint weapons of these early men? Where were their skeletons and skulls?

A lonely cowboy had the answer.



CHAPTER 3

Discovery of the Ancient Hunters

A NEGRO COWBOY, George McJunkin, with a slouch hat, jogged along on a horse. The trail skirted the edge of a deep arroyo which showed jagged black in the late afternoon sun. This part of northern New Mexico is chilly in the spring of the year, and the rider hunched his left shoulder against the nippy wind. His eyes, which were constantly fixed on the ground looking for the tracks of cattle, wandered for a moment to the opposite bank of the arroyo where, some distance down from the top, a line of white bones showed in a patch of sun.

With a slight twitch of the reins, he pulled up his horse to look at the peculiar jumble of bleached objects in the

dirt on the far bank. For a moment the cowboy mused as he sat askew on his horse: these could not be cow or horse bones, they were twenty feet deep; not even buffalo bones could have that cover of earth on them.

The layer of bones in the bank of the arroyo was peculiar, there was no doubt of that. The cowboy hesitated, as his tired horse stood quiet with drooping head; and, as the rider sat undecided, a considerable portion of our early history hung in the balance. Had the cowboy grunted and ridden on, we might never have known about these early hunters. But the New Mexico cowman did not go on. After a moment of indecision, he swung stiffly out of the saddle and walked under the horse's neck to the edge of the deep wash. Because of the interest of this one man, tired though he was, we came to know the story.

As the cowboy slid and stumbled down the steep bank to the bottom of the arroyo, the pale spring sun struck a glitter from among the white bones which he saw before him. He prodded tentatively with his knife at one of these bright objects and a piece of flint came away in his hand. It was no ordinary piece of flint but obviously part of a stone point which had once been a spear tip. Working feverishly now, with something of a premonition of the importance of his discovery, the man pulled and strained at the huge bones protruding from the hard adobe of the bank; and, as he uncovered more and more bones and threw them carelessly to the ground at his feet, he collected sev-

eral of the bits of flint, all of them worked and obviously made by the hand of man.

The flint points were peculiar and like no other arrowheads he had ever found before. Indian arrow tips of the usual varieties were quite common on the ranch where he worked. Some of these recent ones could even be identified as those used by Apache Indians. But the chipped points that he dug from the arroyo bank were different, and the bones with which the points occurred were different, also. They were huge bones, larger even than those of dead cattle with which every range rider was familiar; these bones were massive and white and chalklike. They looked very old and they were a good twenty feet below the surface of the ground, exposed only by the wash of the fast-eroding arroyo.

It is the things out of the ordinary that we notice; the details that do not fit. Even after the cowboy had slipped the pieces of flint he had found into his well-worn blue jeans and remounted his horse, the circumstances surrounding his discovery burned in his mind with an insistent questioning. This was in 1925, and the cowboy told many people in the vicinity of the small town of Folsom, New Mexico, about his discovery.

It was in this way that word reached the ears of Dr. J. D. Figgins of Colorado. Scientists ever have their ears attuned for the word of such a discovery. After all, almost all scientific discoveries are accidents, and this was no exception.

After its original notice in this purely accidental way, the Folsom site became the focus of scientific attention. The word traveled like wild fire that a discovery had been made of flint implements, mixed with the bones of extinct bison. What looked like crumbling, overlarge, curious bones to the cowboy were recognized by Dr. Figgins as the bones of a type of animal that had not been alive for the last ten thousand years!

The evidence was indisputable. "Taylor's" bison, as these extinct animals were known, resembled modern buffalo superficially, although they were somewhat larger. The main difference is that Taylor's bison were characterized by long, almost straight horns instead of the curved-up variety of the Buffalo Bill type of animal. Otherwise, Taylor's bison were much like our modern buffalo; traveling in herds and probably acting much the same way.

The original specimens of the ancient Taylor's bison had been collected only a few miles from the Folsom site. Here paleontologists from the Smithsonian Institution and the University of Nebraska had found these distinctive bison bones in deposits which they estimated to be from ten to fifteen thousand years old. The Taylor's bison truly belonged in the same age with the mammoth and the mastodon.

There they were, the jumbled bones of the animals and the flint points lying in and around them, the points which had probably killed these same animals.

Other scientists arrived on the scene, like bees scenting

honey from afar. Dr. Barnum Brown arrived with his airplane, and Dr. Nels Nelson of the American Museum of Natural History; all of them came to see the site at Folsom, New Mexico, where this indisputable evidence was to be had. The town of Folsom which, previous to this, could scarcely boast a block of houses and stores in its entirety, suddenly assumed wide importance. The region buzzed and hummed with scientific activity. Doctors of philosophy and professors came and went, all of them to view the evidence with their own eyes. Many came with skeptical looks as they voiced their doubts.

"The bones and the flint points were washed together by some chance flood," or "It's an Indian encampment with modern buffalo. It can be no more."

But, as each of these doubting savants looked at the evidence and excavated with his own trowel and his own knife among the bison ribs, he too found the flint points indicating that ancient man had been there. The least experienced among these visitors could tell that the bison skeletons that were being uncovered with such care were in place just as they had fallen, and a dozen paleontologists assured them that these were no ordinary animals but had been extinct these ten thousand years.

The word went out to the newspapers with all the tumult that accompanied the discovery of Tutankhamen's tomb. Newspaper headlines announced "Evidence of Ancient Hunters Discovered 10,000 Years Old!" And even the scientific publications departed from their usual, quiet man-

ner to the effect of: "Evidences of Man Found With Extinct Animals." That rare thing in scientific circles had been achieved—unanimity of opinion. That which a few had suspected and most had doubted was proved. There had been men, very early ones, who lived in that place and who hunted animals now extinct. In true scientific fashion, this unknown was called "Folsom man."

The whitened bones of the Folsom find were uncovered with all the care that would have been lavished upon the exhuming of the crown jewels. These eroding bones were evidence of the first importance. As each one of the skeletons was carefully uncovered and the dirt brushed away and smoothed, the flint points which were revealed from time to time were carefully left in place. Just enough was cleaned from their surfaces to indicate their positions. Drawings were made with all the care of the surveying of a building site; photographs were made from every angle to indicate the exact relationship of the flint points with the skeletons of the animals. What had been a growing conviction during the excavation soon became a fact. Some kind of Early American had been there and had killed these bison with the flint points which still lay among the bones.

The flint points that were found among these bison's ribs were no ordinary flint points, as the Negro cowboy had immediately recognized. In shape, these points were like a short bayonet with a groove running up either side. They lacked the usual notch at the base that characterized the later Indian arrowheads. The points varied from an inch

to three inches in length, and obviously had served to tip light javelins or spears. These were no arrowheads, since the bow and arrow, as far as we know, had not been invented at this time. These grooved points, or Folsom points, were exquisitely made. The grooving and the chipping along the edges and at the point were delicately done, obviously by the hand of a master. It took no expert to remark that these earliest of points so far found in North America were among the finest examples of flint chipping in the New World. This was different, indeed, from the first crudely shaped fist axes of northern Europe, which had also been found with extinct animals. What could it mean?

As point after point came to light beneath the careful trowels and brushes of the archaeologists, more and more evidence bearing upon these early men came to light. The tailbones of the bison represented among the animal skeletons were almost invariably missing, and yet most of the other bones were in place as though the animals lay where they had fallen. It was pointed out that, when you skin an animal, the tail goes with the hide; and it seems almost a certainty that the hunters who had killed the bison there did so almost exclusively for the skins.

Only here and there was a leg missing, as though one of these ancient hunters had hacked off a particularly delicious-looking haunch and dragged it off to his campfire. On one of the skeletons, the bones showed the marks of flint knives as though some tenderloins and steaks had been cut away from the fallen animals. But for the most part, it seems to

have been the skins that the hunters were after. This, in itself, tells us much. What would they want skins for? Clothing, of course; perhaps, also, to throw over a pile of leaves for a bed. Hence, these men at least were not naked savages.

If we needed any further evidence, it was to be found in the same place, for not all the bits of flint among the bones were spear points. Here and there was a small, snub-nosed scraper, roughly fashioned out of a flint chip. With the sharp edge of these scrapers the Folsom men dressed down the fleshy insides of the hides which they had stripped from these fallen animals. It took no great amount of imagination to picture the scene of the slaughter and the subsequent skinning and dressing of the hides. It must not be forgotten that this scene took place near the town of Folsom ten thousand years ago; ten thousand years was a very long time ago for this New World.

Not only were the bones of the extinct Taylor's bison an indication of the antiquity of these deposits, but there were other evidences as well. As the Folsom site was uncovered bit by bit, and skeleton after skeleton was revealed, it was indicated that these animals had fallen around the edge of what had once been a small pond or lake. Doubtless the animals had been coming in to drink when they had been ambushed and slain by these successful hunters of long ago. The long-dried-up mud and pond deposits beside which the skeletons lay was an indication that the region had once been very much wetter than it is today. There is no pond or lake near Folsom at the present time. Here was evidence,

indeed, that the country of the Folsom hunters had been a land where lakes and ponds dotted the countryside; and rivers and streams had flowed where only dry arroyos remain at the present time.

The only age when the rainfall was as heavy as indicated by these wet deposits was in the time of the last great continental glaciation. So, not only had these Folsom men seen and killed extinct types of bison, but they also had seen, with their own eyes, the great continental ice masses to the north; they had felt the chill and wet winds which swept off of those glacial cliffs; and they had hunted game along the streams that flowed away from them. The scientists at the Folsom quarry did not need to measure the twenty feet of earth that lay on top of the bones to demonstrate that at least ten thousand years had passed since some unknown man had killed the animals there.

Everything bespoke the undoubted antiquity of the spot. Dark lines in the arroyo bank showed where grass had grown around this quiet lake. This was the herbage upon which the straight-horned bison had been feeding at the water's edge. Now the grass shows only as a streak of black-colored humus in the adobe bank, many feet below the surface. As the glaciers shrank back into the hinterland to the north and streams and ponds which had been fed by the ice dried up, the dust from the bare beds was whipped into the air by the winds and storms of those bygone years. Layers of dust settled on the dead grass and on the animal bones that sprawled where they had fallen. Passing centuries added

dust and dirt to the cover that collected over the skeletons of these bison around the Folsom lake. With the infrequent rains of the drying climate, more soil was washed from the surrounding low hills to further bury the evidence. It was revealed again only by a chance gully, or arroyo, which had cut down through the superimposed earth layers to show what marvels of human history were buried there.

And the Folsom lake itself was represented now only by laminated layers of sand and hard mud to show where the water's edge had once been in those lush years. Some of the bison skeletons lay partly in what had been shallow water, as though the animals had been drinking when they were killed. Here and there in the dried lake bottom was a scattered Folsom point where a spear shaft had missed its mark and embedded itself in the oozing mud of the shallow water.

At the head of the Folsom valley now stands the volcano known as Capulin Mountain. It has been long extinct and its steep slopes and tumbled lava rocks have been cold and lifeless for the last several thousand years. It is easy to see the picture that the Folsom hunters saw, however, when they stalked the straight-horned bison in that gentle valley. As these men crouched behind the clumps of bushes and grass on the edge of the swale where the bison were feeding, a thin curl of smoke floated up from the fire mountain in the background. Neither the bison nor the hunters stalking them, however, evidenced any interest in the muffled

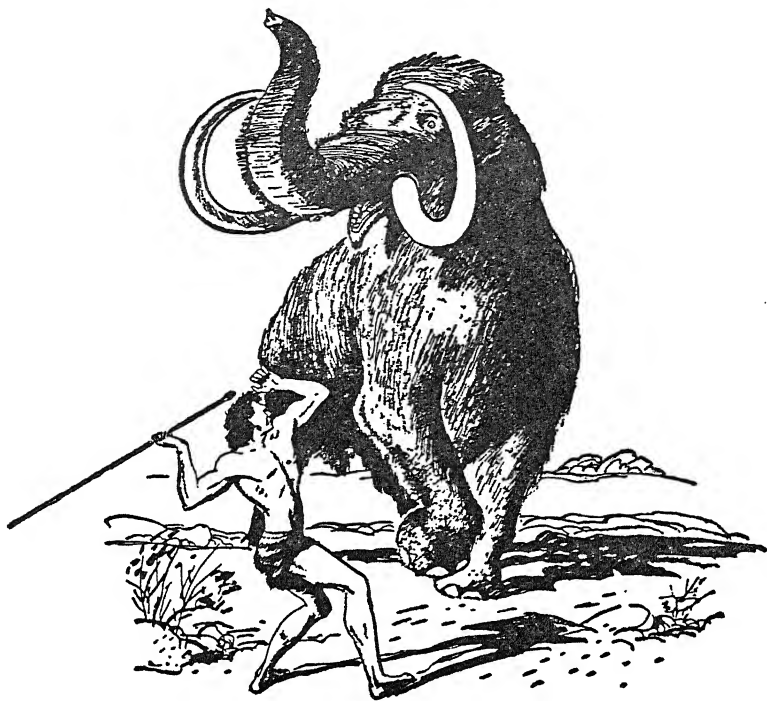
rumbling of the volcano. These were usual things in those days.

And the Folsom men themselves, what of them? Between the bison ribs and shattered on the heavy leg bones of these animals lay the flint points of the successful hunters. The flint points are made with consummate skill. Clever and sure were the hands that cast the spears that killed these animals in their tracks around the quiet lake. But didn't one hunter die on this place? Didn't at least one of the hunted animals gore a too audacious spearman with those long bison horns? Surely we would expect to find human bones and possibly even a good human skull among the other animal bones of the hunting place. Hunting buffalo on foot with only a light lance would be extremely sporty work.

If the bison bones were well preserved, there is every reason to expect that human remains would be also. However, in spite of a minute examination of every bone fragment from the Folsom site, not so much as a human front tooth was revealed among them. What did the Folsom hunters look like? Were these men beetle-browed like Neanderthal Europeans? Since we found not one bony skull in the Folsom shambles to give us this information, we shall have to look further.

Even though the actual hunter somehow escaped leaving any of his own bones bleaching among the Folsom bison, nonetheless the marks of this ancient hunter are abundantly clear. The debris and wash of the closing phases

of the icy convulsions of the great glacial age gave us our clue as to the time. At one fell swoop the real antiquity of the New World was established. Geologists, who consulted on the matter, varied in their pronouncements between ten thousand and fifteen thousand years for this so important discovery. After all, the dating of the continental ice sheets could not be exact; but what is a thousand years, more or less, when we are speaking of times like these? Suffice it to say that at Folsom, in northern New Mexico, sheer chance and a wandering cowboy had brought to our attention the first evidence of the presence of Americans at a time far earlier than we had dared to imagine.



CHAPTER 4

The Spread of the Folsom Hunters

MAN IS ESSENTIALLY A DIRTY animal. This is not merely a cynical observation on the condition of a ball park after a double-header game. By nature we are slovenly. Tidiness is a distinct effort for the human and is a phenomenon associated only with complete civilization. It is fortunate that at times man has had these dirty tendencies.

Our earliest ancestors, the hunters with whom we have become familiar, began this sloppiness. These ancient progenitors existed among and on top of the debris of their own living. When they had gnawed the tenderloin from a bison rib, they tossed the greasy bone behind them with complete abandon. The early Neanderthal men in their caves threw the bones which they had finished into the back of the cave or out the entrance with equal facility. As a man rests at ease in front of the campfire after a hard day's hunt, the clearing away of the remains of a meal consists only of depositing the debris somewhere out of reach. And so, when the ashes of the ancient cooking fires became deep and cumbersome, they were simply scraped to one side. When dust and leaves and worn-out animal skins and pieces of firewood grew to a mound around the place of human habitation, the next inhabitant simply lived on top of the pile. Year after year these human accumulations grew without any apparent attempt ever to clear them away. Century after century piles of bones, charcoal, flint chips, worn-out tools, and all the litter and accumulation of human occupation piled up around the spots where man had lived. In many places caves that were used for a long time were completely filled with the remains of man's living. Camping sites along the banks of rivers and streams and by favorable hunting places grew into mounds of bones and charcoal from the feasts and fires of man. In some places in Europe the thicknesses of human accumulation are over sixty feet deep with debris left there by ancient man.

Were it not for these remnants of his passing, we should know little of ancient man. The Folsom site itself was discovered from bones sticking from the arroyo bank. The bones of the animals upon which ancient man fed are the surest indication of his presence. Charcoal and the remains of fire in and around these bones make his presence practically a certainty.

Not only do these piles of human detritus indicate where man has lived and fed himself, but they also show a succession of history in those places. Danish archaeologists discovered two centuries ago that human middens gave an indication of the various kinds of men that had lived on a certain spot or in a particular cave.

The first men to inhabit a particular camping place threw their bones and scuffled the embers of their fire on top of the virgin soil of the site. Later men, attracted by the same spring or good hunting that had appealed to the first, made camp on top of the remains left by their predecessors. Century after century different men killed different animals and dumped their bones on the accumulating piles. These camp sites of men are like a great book horizontally placed. The lowermost leaves or layers of ash and bones are the opening pages of the story. Later levels piled on top of the first give succeeding chapters of the epic of that particular camping site. The debris heaps of man may show, then, to the archaeologist who cuts through their pages, a saga of human occupation, from a Folsom point with bison bones in the bottommost levels to a tin can with cow bones on top.

The rubbish heaps of antiquity are our most lucrative sources of information.

With the discovery of the Folsom site and its acceptance by the scientific world as absolute proof that a very early hunter had lived there and had killed animals there ten thousand years ago, an immediate effort was made to find other Folsom camping places. The original Folsom quarry itself was not a habitation site. It seemed only that ancient men had stalked and killed bison around the Folsom lake and had dragged their skins and part of the flesh away to some other spot. What we really needed, once we had the evidence of such men, was to find their living places so that we could discover how they lived, what kind of houses they had, what tools they used, and, in general, what life meant to them. We were not entirely disappointed.

Early in the years following the original Folsom discovery, Folsom points began to turn up over a wide area. These flint tips with their distinctive side grooves were so outstanding that they could be recognized by any farmer boy or city businessman out for an afternoon hike. If reports came in that Folsom points were discovered amid piles of bones, the evidence seemed almost conclusive. In the early years of the 1930's several such promising spots were reported and investigated by various scientists who were avidly searching for the real home of Folsom man.

To date, some dozens of Folsom camping sites have been reported. Some of these are disappointingly scanty, as though the elusive Folsom man had stopped only a few

nights or at the most a few weeks at the spot. In places, these hunters had apparently knocked down some bison with their spears or had even been lucky enough to worry a mammoth to an early end so as to feast on his coarse meat for a few days on the spot where he fell. These ephemeral camping places, with two or three Folsom points and the skeletons of a few animals, gave us little more information than we already had. However, quite by accident, two places were discovered where Folsom men and Folsom women too had camped and slept and ate and probably died. These were similar to places which had been found in Europe where men had lived on top of the debris of men. They were delightfully dirty places where the rubbish had piled up in a most satisfactory manner.

Probably the most interesting of these places was the one at Lindenmeier, a ranch in eastern Colorado so named from the owner of the land. The spot lies only a few miles from the Wyoming line. The finding of the Lindenmeier site reads almost like a duplicate of the original Folsom discovery. Folsom points were found by some local residents. On the edge of an arroyo, bones and chips of flint were weathering out to attract the attention of investigators. Preliminary digging and scuffing on the sides of the arroyo revealed several flint points of the familiar Folsom pattern. It is extremely fortunate that Folsom flints are so different from the many other varieties which might otherwise tend to obscure this early phase of American life. A Folsom point can be recognized anywhere.

The Lindenmeier site represents a camping place where Folsom men stayed a long time, certainly several years, although they may not have lived at the spot the whole year round. The surface of the ground has changed much since the lush, wet times when these early Americans lived there. Now the spot is a sloping plateau cut by broad, deep gullies. The several years' excavation and examination by the Smithsonian Institution on this camping place, from 1934 to 1940, has shown that the top of this plateau was, in Folsom times, the bottom of a shallow valley. To an easterner the Lindenmeier country at the present day is dry, austere, and sparsely vegetated. Perhaps it would improve the casual visitor's appreciation of this portion of Colorado to learn that the Lindenmeier valley was in Folsom times a place of small lakes and marshes and lush meadows with scattered trees. Here the great straight-horned Taylor's bison fed and watered and wallowed in the mud. It is no wonder that Folsom men also built their campfires and gnawed bison bones on this spot.

Up and down the floor of this valley that has now disappeared the piles of bison bones from the hunting of Folsom times accumulated. In and around them are the flecks of charcoal from the ancient fires. It has been ten thousand years since those black bits of wood glowed red.

Mingled with the scattered bison bones were the pieces of flint that give direct evidence that man was the animal that laired there. Here and there was a Folsom point. If we needed any further proof to dispel any lingering doubt, one

Folsom point was found embedded between the vertebrae of a bison. Men, Folsom men, had killed and eaten bison on this spot and had thrown their bones out of the ring of the firelight when they had finished their meal.

Fortunately, Folsom points were not the only implements discovered on this spot. Mingled throughout the Folsom rubbish heaps were flint scrapers, flint knives, flint gravers, and even a few bones which had been worked by the hand of man. The flint scrapers were less carefully made than the Folsom points. A large chip of flint was haphazardly rounded off to produce a scraping edge. If we had found these scrapers anywhere else, we probably should not have given them a second glance. The Comanches or the Apaches or any other Indians might have used the like.

The flint scrapers on the Folsom site, however, show us that Folsom men scraped animal skins. At the original Folsom site there was some evidence that the bison there had been skinned. These skins could be only for clothing and beds. We progress in our knowledge of these early men. We can now dress them with fair certainty in some sort of a breechclout or wrap-around robe. In the cold, wet, glacial evenings a curly-haired bison skin would have been a welcome adjunct to a savage wardrobe.

The flint knives, too, tell their story, even though it is an indirect one. Some of these cutting implements were made in the form of very large Folsom points, complete with the channel grooving, as though the hunters had found this the most successful form of flint implement for their purposes.

Other knives were simply long, straight-edged flakes of flint struck off carelessly from a parent chunk. Folsom men knew how to take advantage of the innate property of flint. Far back in the beginnings of human time the fist-axe men had discovered that flinty stone would fracture with a sharp, cutting edge. A flint knife which may be shaped in one or two minutes will cut the toughest steak. Its brittle end may be broken easily with the hand, but its edge is a fine cutting medium. In many ways the table service of Folsom men was superior to our own.

If we needed any additional evidence as to how the hunters used their flint knives and scrapers, it was to be found on the bones themselves. Bison bones were scratched and marked with the strokes of these flint knives. Here and there the flint edge had cut too deep as the skin was being removed or the meat cut away from the bones. From these ancient scratches on bison bones we can deduce that the Folsom butchers were none too careful about the cut of their steaks. Any chunk of meat tastes good when roasted on an open fire.

Frequently at the Lindenmeier site were encountered small fragments of flint which were classified as "gravers." These chips were shaped to a fine, needlelike point in one or more places. The result was an implement with a point much like an awl, which could be held between the two fingers. These may have been used for perforating the edges of skins, although no needles were in evidence nor any other intimation that Folsom men or women knew how

to sew. From the sharpness and shortness of these flint graver points it is suspected that they were used for tattooing, which purpose they would have served admirably. From our knowledge of other primitive peoples in other parts of the world, we can even make a good guess as to how they accomplished this form of decoration. With the sharp flint point a design was punctured through the skin along the desired lines. This was best accomplished by making a series of punctate perforations through the skin but to no great depth. The process is slightly painful. The permanency of the tattoo was secured by rubbing charcoal from the campfire along the line of perforations immediately after they were made. The powdered carbon from the burned wood was rubbed into the punctures, and the series of small black dots thus made were rendered permanent by the skin's healing over the top. Tattooing is among the most ancient forms of human ornamentation known.

With a handful of flint implements, then, and a roughly tanned bison skin around his middle, the Folsom man was completely equipped. From the size and shape of the Folsom points we are certain that these were mounted on spears. With this repertoire of puny flint weapons Folsom man sallied forth to kill the ponderous bison and the mighty mammoth. That he did so is attested by the piles of bison bones that the Lindenmeier excavation revealed.

More by inference than by any actual discovery, we are certain that Folsom man had one more weapon in his bag

of tricks. This weapon may well hold the secret of how he could drive a Folsom point with sufficient power to penetrate a bison's flank. This implement was the spear thrower.

As the spear thrower was almost invariably made of wood, it is no wonder that it was not found at Lindenmeier. We do know that the spear thrower was used long before the bow and arrow in North America. The earliest perishable remains, which have been discovered in several dry caves in the Southwest, show that the Indians, about the time of Christ, were familiar with the use of this gadget. The bow and arrow apparently arrived here several centuries later. The light javelin tipped with their familiar Folsom points could best be used with the added impetus of the spear thrower.

This interesting implement, as the name implies, is an aid to the human arm in the throwing of a spear. It consists of a shaft of wood about two feet in length which is held in the hand. At one end of the spear thrower is a short hook or a pin which fits on the butt of the spear shaft. The spear or javelin, when thrown, is thus given a tremendous impetus by the added length of the spear thrower. The thrower, by the use of the additional piece of wood held in the hand, increases the leverage of the arm. The spear thrower is retained in the hand after the javelin is cast. Small hand holds or a leather thong on the end of the spear thrower help to retain the thrower in the hand at the moment that the javelin is cast. A seven-foot javelin of the Folsom variety may be thrown 60 or 70 yards from a man's hand. With a spear

thrower, it may be thrown 150 yards. For close-in thrusting the spear thrower provides tremendous power with its leverage for piercing tough animal hides and thrusting the lethal flint point tip into a vital part. The fact that Folsom men hunted mammoths is made plausible only by knowledge of the use of the spear thrower. A javelin thrown only with the bare unaided hand would not penetrate the skin of a large animal.

The Lindenmeier camping place of Folsom men was revealed by the cutting of an arroyo. Another famous Folsom habitation was discovered by the winds of chance. During the dry years of the late 1920's and early 1930's the "dust bowl" portion of the great plains became so desiccated that the top soil was blown away in the midst of blinding clouds of gritty sand. What was an ill wind to the farmers and ranchers of the region was a favorable circumstance for the archaeologist. Up and down the reaches of the High Plains the top soil which had accumulated there for century after century was removed in the space of a few short years by the scourging winds. The stones and bones that had been embedded deep out of sight in this top soil, or beneath it, were left as residue when the dust storms had passed on. It was as though the desiccated hand of the wind had lifted a 10,000-year-old cover from the surface of the land to reveal the lakes and streams and valleys that Folsom men had traveled. It is true that the lake beds were simply dry basins, innocent of any suggestion of moisture, and the valleys were winding, low places in the dry plains. But the evidence

of the wet, dripping times of the Folsom era were everywhere about.

Folsom points, Folsom scrapers, and the bones and debris of Folsom times were revealed year after year in these "blow outs." Ranchers who weathered the dry times became accustomed to the sight of crumbled mammoth tusks appearing white in the dry soil as the dust blew away from around them.

Nowhere in all the Plains area were these indications more plentiful than in the region around the small town of Clovis in eastern New Mexico. In this region collectors found not only Folsom points but abundant evidences of extinct animal bones covering a very wide area. As before, scientists were called in and the search for Folsom man was intensified. The Clovis region really revealed its antiquarian wealth when a road company dug a gravel pit down through these early deposits and found, in the process, literally tons of ancient bone and not a few telltale flint points. The Clovis camp site proved to be not only one of the most extensive, as it stretched for miles, but also one of the most interesting of the habitation sites of ancient hunters.

As in the case of Lindenmeier, the Clovis hunters had lived around the edges of a series of lakes which have disappeared during the last ten thousand years. The wetness and the lushness of the country attracted herds of early animals and consequently the men who fed upon them. One of the most interesting features was that at Clovis not only the

bison bones but also mammoth bones are common, with a generous sprinkling of horse and camel. The Clovis hunters were not particular what kind of meat fell before their spears. These mighty hunters hacked down the mammoth or harried the fleet-footed camel with equal facility. The results of their prowess are heaped in piles of bones that stretch for miles in all directions throughout this ancient hunting paradise.

Folsom points, Folsom scrapers, knives, and other flint accouterments of a hunting way of life show that the ancient men actually lived there. Great areas of charcoal and fire-blackened bison bones show where barbeques took place. Scattered over the large area are the intermittent signs of bands of men who hunted, ate, and slept there. It is a complete picture of the Folsom way of life.

There are some differences, which we might expect, as Clovis is several hundred miles from Lindenmeier. Archaeologists now distinguish two kinds of ancient hunters who camped there: an earlier man using elongated Clovis points and hunting mostly mammoth; and a later, typical Folsom group using shorter fluted Folsom points and hunting bison. They both lived much the same kind of life.

In both the Clovis and the Lindenmeier situations there were some startling things that were absent, as well as some interesting things that were present in the accumulations of debris. All the scientific rooting which we have accomplished so far in these ancient accumulations has revealed no sign of a house or even a crude wooden structure. Even

a skin tent would reveal in the hard-packed, ancient soil the marks of the tepee holes or the posts which had held it erect. None has been discovered. Are we to suppose that Folsom man wrapped himself in a bison skin and weathered out the wet and dripping nights? The winds coming from the ice masses to the north must have been chilly even on dry days. Certainly a hardy Folsom hunter would have turned some of his ingenuity toward the manufacture of a variety of shelter. Possibly the next large Folsom site that we discover will give us the answer.

Outstanding is the absence of Folsom man himself. We have described man as a dirty animal. Ancient men were usually just as careless about their own bones as they were about those of the animals they killed. Practically no camping site of ancient men in other parts of the world is devoid of human bone. If they didn't actually bury their dead, they kicked their bones onto the refuse piles with the accumulation derived from other sources. Caves that early men inhabited almost invariably reveal the bones of some unfortunate who died in his sleep at the back of the cave and who had been covered up. The very least we could expect is that some dead hunter, forgotten and despised, was scraped to the side with the rest of the animal debris. Even if Folsom man might have been too primitive or too unenlightened to bury his dead, we should certainly expect to find parts of them in and around his camping spots.

At neither Lindenmeier nor Clovis, nor for that matter at any other Folsom site, has there been discovered so much

as a front tooth of a Folsom man. Amid the tons of bones that have been exhumed from these early rubbish heaps, not a single fragment of human bone has come to light. A possible clue as to what the Folsom hunters did with their dead turned up near Midland, Texas, and was found by an oil man.

In a blowout near Midland, this oil worker and amateur archaeologist discovered in 1953 fragments of a human skull. In the same blowout, the discoverers picked up two lance points which were almost identical with Folsom points but lacked the flutes or grooves on either face. When archaeologists examined the site, another Folsom-like point was found close to additional fragments of human bone. When the pieces of skull were assembled, it turned out to be the fragmentary head of a woman. Apparently the wife of some hunter of Folsom times had followed her husband on a hunt in what is now central Texas. Here disaster overtook her and her husband also, perhaps. The rest of the hunting band, if they witnessed the tragedy, left the woman lying where she fell.

The Midland woman probably belonged to some offshoot of the Folsom hunters in the southern Plains. However, we can reconstruct a fair picture of typical Folsom Man without looking into his bony face. We know what animals he killed. We know approximately how he killed them. We know what he did with them after the slaughter. Some of the other aspects of his life are not so easy.

As letters came into the scientific institutions after the

Folsom discovery telling of Folsom points and flint and bone finds in many parts of the country, we began to get a fair idea of the range that these men called their own. Their favorite hunting grounds were on the eastern slopes of the Rocky Mountains and the western edge of the Great Plains, comprising the areas which we now call eastern New Mexico, the panhandles of Texas and Oklahoma, eastern Colorado, western Kansas and Nebraska, and extending north into Wyoming, the Dakotas, and thence on up into Canada. Throughout this great area the Folsom men trailed herds of game. As the bison and the mammoth and the horse fluctuated and moved with the seasons, there is no doubt that Folsom men did also. Here and there in favorite hunting places these hunters dragged the portions of their kills. There the Folsom women built the fires and roasted the flesh. This country was their own. Apparently it was uncontested except by the animals among whom they lived. The Folsom men were not only the earliest Americans found until that time, but they were among the mightiest of hunters.



CHAPTER 5

Ancient Immigrants to the New World

THE DISCOVERY OF FOLSOM man answered one question and posed another. As every scrap of scientific evidence we possess points to the development of man in the Old World, obviously it must be demonstrated how he progressed from his place of origin to these virgin regions. We found his camping places and the ashes of his fires along 10,000-year-old lakes almost in the center of the North American continent. The bones of the animals he killed give us the approximate time that he camped there. Study of the glacial deposits and of the rivers and lakes that

accompanied them give us an even more certain chronology. But how did Folsom man get to that spot and from what direction? The saga of the first American obviously lacks a beginning.

When the Pilgrim Fathers saw their first red men in the tree shadows of the New World shores, they wondered at the origin of these strange humans. Had not the admiral, Columbus, intrepidly sailed the untracked ocean wastes to find these new lands? Surely no savages such as these who timidly inspected the European ships in frail canoes could have made such a voyage. They must have come from the other direction, the Europeans reasoned in their dilemma. They were more correct than they knew.

It is true that the earliest explorers had mistakenly thought that the West Indies and our east coast were the shores of the Indies and the Spice Islands and had called the inhabitants "Indians" for this reason. Even after Balboa had discovered the endless Pacific as he stood on the heights of the Isthmus of Panama, the thought persisted that somewhere to the vague northwest a connection with Asia would be found. The name, Indians, continued to be applied to these natives even though each successive wave of exploration showed them to be more and more widely separated from any connection with India.

The Pilgrims in New England and the Spaniards in Mexico almost simultaneously attempted to explain the origin of the American Indian through religious channels. One of the favorite explanations was that these benighted,

copper-skinned brethren were the descendants of the Seven Lost Tribes of Israel. This explanation certainly had religious support. It accounted for the presence of human-like beings so far from the Garden of Eden and also indicated that the ground lay fallow for the reconversion of a very satisfying group of Christian souls. It did not answer, however, the burning question of how the Seven Lost Tribes of Israel had crossed thousands of miles of tossing sea water to get here. There were other difficulties as well, paramount among which was the disappointing fact that among the multitudinous religions on this new continent none were reminiscently Jewish or pre-Christian.

Not a few of the early Europeans believed that the American Indians who howled around their settlements and blockhouses were creations of the Devil, begotten by Beelzebub especially to plague them. However, such extraordinary explanations of origin were not satisfying even in a community that believed in witches.

One of the first even faintly logical explanations which the early Europeans proffered for the population of the New World was that the Indians came directly from Europe. This was more egotistical than logical. From the time of the Middle Ages, Europeans were inclined to be egocentric and to believe that everything worth while originated in the European Peninsula or, at least, in the Holy Land close by. That the population of the New World had been derived from European sources when the Rhine and the Thames "were in a state of savagery" seemed

a little farfetched even in 1620. The early traders of Phoenician days, who had achieved more than a casual reputation for dare-deviltry and audacity on the high seas, had crept with extreme caution out of the Mediterranean through the Pillars of Hercules and coasted up along the shores of Europe. It is true that in classical times traders such as these had discovered the Azores and the Canary Islands and undoubtedly had felt their way along the shores of Africa. However, this was only a few centuries before Christ, when man had developed far beyond the primitive state of the American Indians.

Our story obviously begins some thousands of years before this time and the characters are primitive hunters who possessed only a knowledge of flint chipping and a native ingenuity by which they could outwit the animals among whom they lived. By no flight of our imagination can we suppose these primitive hunters possessed boats or the knowledge to navigate them. The wide tracks of the Atlantic effectively separated the Old World from the New for many hundreds of thousands of years. We shall have to discover some far more logical mode of immigration than a mythical "Swan Boat" of the year 20,000 B.C.

Persons when in such difficulty normally consult an atlas. If we do likewise in this case, we shall find that any map projection which does not too badly distort the latitudes toward the two poles will give some help. Burning in our memories is also the romantic fact that certain extremely audacious or thoroughly lost Norsemen discovered Iceland

and subsequently Greenland across the northern Atlantic seas. Scientists very nearly as early as colonial days had suggested that these two land masses might have been the stepping stones by which man entered the New World.

The route of entry into North America by means of Greenland and thence to Labrador and down into the interior was in Folsom times as improbable as it was chilly. Even today the large island of Greenland is covered with a glacial icecap. There is every reason to believe that this has been the case for many thousands of years. Added to this is the fact that in the area of eastern Canada another glacial center figured very largely in the early history of the North American continent. We cannot discuss the first Americans without discussing the Glacial Age in which they lived, even though their beginnings are to be found among the debris of the closing phase of that age. The North Atlantic is cold enough at the present day—during those times it must have been frigid.

The actual temperature of the Greenland route is not its only unattractive feature. Even though there may have been ice masses to provide a frozen bridge from Greenland to the North American shores, there must have been reaches of uncrossable water between Greenland and Europe. The Greenland route gets very few votes on this score as a possible mode of entry for our early men. Even if by some premonition they foresaw the New World goal across the devious route, they would never have had the means of making the crossing.

By far the most attractive theory of entry of late years has been that of the islands of the South Pacific. Warm by comparison with northern seas, the South Pacific is intriguing in its surroundings of romantic glamor, and some rather cogent arguments may be brought up in this connection. Americans, addicted to Sunday supplements and having teethed their scientific incisors on tales of darkest Africa and the unknown wildernesses of the Amazon Basin, have always been prone to make explanations by utilizing unknown areas. The South Pacific has for many years, in spite of trade connections, been one of these unknown areas. Why could we not place all our troubling facts in this unexplored grab bag and thus save ourselves unnecessary worry in this direction?

The greatest impetus to the South Pacific theory has been given by the discovery and later description of Easter Island. This romantic bit of land lies some two thousand miles off the coast of Chile and is separated by another eleven hundred miles of open water from Pitcairn Island, which is the nearest inhabited body of land to the west.

The island first rose into prominence because of the discovery there of a number of extremely provocative stone monuments and stone platforms and other architectural features, which seemed not only ancient but out of place in that part of the world. The aura of mystery and antiquity of Easter Island was heightened by the fact that there were discovered there a number of tablets and plates covered with an undecipherable script. If there is anything more

intriguing than an unexplored river valley, it is an unexplored writing system. Such untranslatable pieces of written lore are extremely rare and they are all the more exciting since the pieces of history which they undoubtedly contain seem tantalizingly close and yet untouchable until the key to the script is discovered.

The stone monuments of Easter Island are in the form of the upper portions of human torsos, having heads with very long noses and extremely accentuated ears so as to give the faces a grotesque and extremely characteristic outline. These steles in the human form are from three to thirty-six feet in height and lean crazily at all angles from the ground in and around the stone platforms which ring the coast of Easter Island.

At one time in the early 1900's Easter Island bade fair to being the Rosetta stone that would unlock the mysteries of the New World. The grotesque stone faces of the Easter Island idols and the mysterious script found on tablets in and around them gave the promise of telling all that we wanted to know. The voyage of the Kon-Tiki raft and Heyerdahl's explorations in and around Easter Island have heightened interest in this fascinating bit of land.

The present inhabitants of the island are Polynesian with a generous admixture of Negroid. Their customs and speech demonstrate indisputably that they belong with the rest of the South Sea Islanders rather than with the peoples of South America. There is no doubt that Easter Islanders are true members of the South Sea hierarchy in spite of their

isolation far to the eastward of the other groups of islands. The fact that the island is populated by Polynesians forces us to concede that these South Sea Islanders arrived there in outrigger canoes over alarmingly wide expanses of ocean. Easter Island is a monument to the importance of this simple principle of fastening a log alongside an otherwise frail canoe to give it stability even in rough seas.

But we might argue that if the South Sea Islanders successfully navigated in outrigger canoes from Pitcairn Island over more than a thousand miles of open water to reach Easter Island, why could they not have continued on to the coast of South America? Actually voyages of South Sea Island natives as they traveled to and from the Hawaiian Islands which were, of course, also connected with the South Seas, have been recorded for as long as the two thousand miles which separate Easter Island from the coast of South America. It seems logical to suppose that some dark-skinned Polynesian with his canoe freshly provisioned at Easter Island sailed into the rising sun until he found the mountains of a new continent rising from the water.

In several Peruvian graves of considerable antiquity, artifacts of South Sea origin have turned up as intrusions in an otherwise native Andean culture. Notable among these were several "sword clubs" which are so typical of various areas of the South Sea Islands and totally foreign to Peru. Even if these could be explained away in some manner, there is no doubt that we shall have to admit that some Poly-

nesian boatload of dark-skinned islanders landed on the Peruvian or Chilean coasts. If only we knew the names of these navigators of several centuries ago! Such a voyage, even though it was made only once, outranks the exploits and the audacity of Columbus. This New World was not so virgin after all!

Even with the very satisfactory outlay of navigational talent exhibited by South Pacific natives, our questions of the method of immigration to the New World are not answered. Modern archaeological researches in Easter Island have failed to reveal any great antiquity. There is no succession of cultures there. The modern natives discovered on the island were still using the stone platforms on which to expose their dead instead of burying them. They were still quarrying and carving the stone anthropomorphic columns when the first Europeans landed on the island. There is no evidence of any extremely early occupation of the island and certainly nothing comparable to an ancient hunting or shell-gathering group of peoples. Indeed, researches throughout the South Sea Islands, and especially in those groups which lie directly to the west of Easter Island, indicate that all these tidbits of land were occupied by humans disappointingly late in the scale of cultural development. The Solomons group, which we have come to know so well, is undoubtedly the origin point of the first inhabitants of Easter Island. The Solomon Islands were populated after the time of Christ by the spread of Polynesianlike

peoples from other islands even farther to the west. There is no substratum of hunters such as Neanderthal man or even the later Folsom man.

There may have been two waves of peoples who plied their small canoes from island to island. Possibly an earlier one from Melanesia, paddled by dark-skinned, Negroid-like peoples, was followed by later groups of canoes sailed by Polynesians of the better known varieties.

Heyerdahl with his Kon-Tiki raft and by archaeological excavation has sought to demonstrate that certain Andeans of early times sailed out to the South Pacific islands and took with them religious habits such as building pyramids and stone temples. Even if this east to west movement of later centuries may be established, it does not help with our basic problem.

Reluctantly we must relinquish the South Pacific route as the mode of entry of the first Americans. We must discover a route that was plausible and possible as well as usable during glacial times. Late in the eighteenth century the northwest coast of North America began to receive some attention in this regard. The coasts of the present states of Washington, Oregon, and California as well as British Columbia and southern Alaska were explored by Captains Cook and Vancouver, those two seamen who have left their names on islands and cities in the areas. These early navigators were struck by the similarities they dis-

covered between the Indians of the northwest coast and certain South Sea Island natives. Captain Cook especially went to some lengths to describe the various points of similarity he had noted between New Zealand aborigines and the Indians of British Columbia. Indeed, some of these likenesses are almost too striking to be coincidental.

Our Indians of the northwest coast are remarkable indeed. Their life is characterized by a great dependence on fish—salmon in this instance—for their livelihood and by a marked predilection for carving and building in wood. These Indians, in spite of relatively primitive stone implements, are remarkable carpenters. Even today the villages that ring the coves and inlets of the northwest coast are characterized by large, barnlike communal houses ornamented and embellished with totem poles. Along with their wood carving in totem poles and canoes they have parallel arts of weaving in wild mountain goat hair and in the manufacture of baskets.

In all these industries the northwest-coast Indians—several tribes of them—have developed a series of significant designs which are so typical as to set them off from any other Indian group. The designs are obviously of pictorial origin and show eagles, ravens, whales, bears, and the whole gamut of land and sea mammals, with telling definition. These pictures had, however, in comparatively early times, a number of idiosyncrasies and peculiarities which further

render them distinctive. Once you have seen how the Haida tribe draws a picture of a whale, you will never fail to recognize that technique anywhere else in the world.

This northwest coast carpentry, weaving, and iconography, distinctive as they are, are remarkably similar to the wooden buildings and the artistic decorations of the buildings of the Maori peoples of New Zealand. This noteworthy fact was emphasized by a number of the early sea captains who sailed their wooden ships into the harbors of both of these widely separated coasts.

Added to this intriguing evidence of connections over unbelievably wide stretches of the Pacific is the fact that certain of the primitive Japanese also were remarkably similar in their culture to our northwest coast Indians. These primitives who formerly inhabited the isles of Japan and who still linger in the northern portion of the archipelago in a few isolated, atavistic groups possessed woven blankets and baskets decorated with designs closely akin to those which may be found in the curio stores of Alaskan towns today. If the aborigines of our own northwest coast and the early inhabitants of the Asiatic shores show so many similarities, why cannot we demonstrate some very early connection? Possibly this was the way that the first American traveled to this continent?

Similarities in art and carpentry are not the only items that may bolster the theory of such a pan-Pacific connection. The American Indian has long enjoyed a reputation for appearing "Chinese." More than one tourist woman has

remarked as she has played with an Indian papoose, "Why he looks just like a little Chinese." The northwest coast Indians have achieved the reputation of looking more Chinese than any other American Indian group. Although this characteristic is a little difficult to demonstrate by any scientific standards, this does seem to be the case. The Mongolian folds, which droop from the middle of the eyelid to give a characteristic "Asiatic" appearance to these peoples, do seem to be marked in these particular areas. The northwest coast Indians often show large mustaches of the black, handle-bar variety which are very unlike the remainder of the naturally smooth-faced American Indians. This gives them an added Asiatic cast.

When the earliest Russians sailed as far south as our California coast in their search for sea-otter skins, they found in the possession of the northwest coast Indians several very fascinating items. Attached to dancing masks at one native village were some brass Chinese coins which dangled and clanked in a satisfactory and totally un-American manner. Some of the dancers themselves, with their un-Indianlike beards and Chinese appearance, looked as though they might have a mixture of Chinese blood. From indications such as these there arose among schools and universities what was long known as the "Chinese-junk theory." This theory sought to explain the populating of the North American continent by means of shipwrecked boats originating on Asiatic shores.

The broad oceans which have been a deterring argument

in our consideration of other theories of approach to these shores actually argue in favor of the Chinese-junk supposition. The Japanese current is a strong surface ocean current that sweeps northward past the Japanese islands and thence swings in a wide arc across the North Pacific to turn southward down along the coast of Alaska and the northwest coast. Fishermen sailing the American shores today often find glass floats that have broken away from Japanese fishing nets many thousands of miles to the westward. The beeches and rocky points of many spots on the Alaskan shore are covered with a litter of bamboo driftwood that was carried clear across the North Pacific by this current. Could not a ship, broken and drifting helplessly at the mercy of the elements, have been carried to the shores of Alaska in this way? A Chinese junk or a Japanese trading vessel even of small size might have drifted with some half-starved survivors into these coasts. The fact that Chinese coins and Chinese masks have been found seems to argue that at least one ship did reach the American beaches in this manner.

In spite of our best efforts to bolster the Chinese-junk theory, we have no evidence that the ancestors of Folsom man either used or envisioned Chinese junks. By no stretch of the imagination can we picture an Asiatic-American stretched on a half-submerged log, bobbing his way from the Japanese isles to the coast of Canada. The glass fishing floats that have made these journeys give every indication of having been months in the water. Even presuming that some individual had floated away from the Asiatic mainland on a

raft strong enough to hold together over this great journey, he certainly would not have arrived in the New World alive. If he had, it would have been an extremely uncertain and unsatisfactory beginning for all the differentiated populations that existed on the continents of North and South America.

If we cannot derive some water-soaked survivor from the Asiatic coasts, it is obvious that it is even more difficult to conjure one from New Zealand. The Chinese junks that drifted to North America did so in times when man built sizeable ships, made brass, and coined money. Those also were not the times that interest us. Folsom Man was an inhabitant of New Mexico and had eaten many a mammoth steak long before the first Chinese built their first seagoing vessel. No doubt the even broader waters of the Pacific, in spite of the Japanese current, proved as effective a barrier to ancient man as did the Atlantic. The answer lies in some other geographical direction.

No discussion of the origin of the first American or his route of entry into the New World is complete without at least a cursory glance at a series of myths and legends that have arisen since classical times. No forum on early man can be held without someone in the back row rising to proffer one or another of these legends as origins for the peoples and cultures of North and South America. Foremost are the myths of the Lost Continent of Atlantis and the Lost Continent of Mu.

Atlantis was supposedly a great continent lying in the

south-central Atlantic Ocean region. It existed, so the accounts tell us, for one million years and sank below the ocean waters ten thousand years ago. The existence of the continent was vouched for by several classic writers, Plato probably being the first to give us anything approximating a co-ordinated description of it.

From the several descriptions of it the Atlantian continent would seem to be more than just an ordinary piece of land that has now disappeared. Everything Atlantian, so we gather from some of the sources, was further advanced than civilizations of today. The atmosphere was heavier than that of the wholesome, earthy atmosphere of the present era. The water was more fluid; the sky more brilliant.

The Atlantians themselves, the original inhabitants, were extremely enlightened people with knowledge far surpassing anything of which modern science can boast. The motivating power of airships was derived from the sprouting strength of growing seeds; houses formed themselves out of trees. All the mystical powers of the universe had been harnessed by these enlightened beings.

Geologists have demonstrated that certain portions of the floor of the Atlantic Ocean were once above the surface of the seawater. Lava fragments, of a type that had obviously cooled above the water level, have been dredged up from the ocean depths. All of these indications look extremely promising, and if taken at their full value might well answer all of our difficulties. Many persons have been swept away by the Atlantian idea to such an extent that they believed

that in Atlantis lay the origin not only of New World peoples and civilizations but of those of the Old World as well.

It must be said that the continent of Atlantis, when the original records are examined, is very vaguely described. The picture by the classic authors of a land lying beyond the Straits of Gibraltar would be equally descriptive of the Azores Islands, or the Canary Group, or portions of Africa. The writers may even have been referring to South America, which some traders of the classic era may have touched before they returned to tell the tale.

The descriptions of the inhabitants of Atlantis can only be characterized as bizarre. To this super-race were attributed godlike powers. Actually these early accounts give little that cannot be described as pure narration. Nor must it be forgotten that classic literature is studded with descriptions of peoples and lands beyond the normal range of experience of the Greeks and the Romans. These descriptions varied all the way from the "Lotus Eaters" of the African coasts to the "Eaters of the Dead" of the Far North. In a few cases we have been able actually to identify certain places or peoples thus described; but the identifications are invariably disappointing. Lands and inhabitants beyond the small circle of their actual knowledge were highly colored by the classic writers, and the whole was shot through with mythology and magic. Equally, from these same sources, civilization in Central Africa and in Northern Europe could be established. The truth of the matter is that these early

tales must be taken with a circumspect mind and extreme scientific caution.

Over and above the apocryphal nature of the story, the time element of the mythical continent of Atlantis is a disturbing feature. In spite of the fact that it was supposed to have sunk beneath the troubled Atlantic ten thousand years ago, the peoples who supposedly lived there do not fit into any of our scientific calculations. For example, a small division of decadent Atlantians were supposed to have begun the modern Aryans. This supposition fits in with no other known rational facts, either linguistic or racial. Instead of answering a question, it presents a whole series of new ones.

We already know that the earliest men were hunters who gradually developed from a primitive but human type to the modern man as we know him today. From his hunting status, he developed by extremely shallow gradations to a more and more complex culture. According to the accounts of Atlantis, we are asked to believe that these inhabitants with their airships and supercities gave rise to the American Indian who exhibited none of the cultural or rational affinities that would be derived from such celestial sources. The continent of Atlantis and its fascinating inhabitants undoubtedly occupies the same place in actual science as do Zeus and his court of willful and eccentric gods on Mount Olympus. The legend of Atlantis, then, is supported by no geological or archaeological facts either in Europe or America. In other words, it does not solve our problem.

The theory of the Lost Continent of Mu is a very close

parallel to that of Atlantis in many particulars. The continent of Mu was supposedly a vast body of land consisting of three major portions narrowly separated by straits of water. These three portions formed a continent extending from north of the Hawaiian Islands south to a line from Easter Island to the Fiji Islands and forming a land mass of five thousand miles east and west and three thousand miles north and south. This very considerable area would comprise a continent in which almost anything might be hidden.

Information about the continent of Mu is based upon two sets of tablets, one purportedly from India and the other from Mexico. The accounts on these tablets have much in common with the classical legends that added up to the continent of Atlantis. Much of the material is fanciful, although in some particulars it is extremely explicit. The continent of Mu was described, for example, as a beautiful land waving with palms and tropical herbage. Mastodons and elephants trumpeted through the Muian paradise. It must be admitted that the presence of mastodons, if this can actually be derived from the stated sources, is somewhat intriguing. Sixty-four million inhabitants, for the most part living in seven large cities, occupied this fair land.

The nebulous nature of the legend of Mu is revealed amply in the description of its inhabitants. As with Atlantis, these are described as highly civilized and supremely happy. The white race was dominant on this tremendous continent, although all lived in peace and utilized their time in the manufacture of multitudinous items of wondrous com-

plexity. Mu was characterized as the center and mother of all the earth's civilization. The centers of India, Babylonia, Persia, Egypt, and Yucatan are all regarded in this legend as remnants of the civilization of Mu.

Not the least exciting portions of the story are the accounts of Mu's cataclysmic end. The description of the fire, earthquakes, ash falls, and trembling volcanoes are awe inspiring in the extreme. The tripartite continent sank beneath the Pacific waves amidst tremors and quakes of world-shaking violence. It is unfortunate that such a tasty bit of evidence as a continent of such proportions should sink beneath the ocean waters and so escape scientific investigation.

The supporters of the Mu series of legends explain the fact that many peoples of the world began in a hunting status by claiming that after Mu sank the remnants of the population that escaped fell into savagery. They explain that the South Sea Island Polynesians and other kindred peoples are the savage remnants of this once noble and enlightened civilization.

It is to be deplored that in trying to answer the question of the origin of mankind we confront ourselves with other even more pressing difficulties. The progress of human culture from a primitive or so-called "savage" status up through various stages of enlightenment can be demonstrated in many places and in too many ways to be controverted. A highly civilized and extremely well-appointed tropical continent is a difficult basis upon which to place such men as we

have described at the Folsom site. Atlantians with their airplanes or Muians with their beautiful architecture would make rather indifferent ancestors for a simple Polynesian native or a Folsom hunter. Rather than explain anything, they would simply make more explanations necessary. The continent of Mu, then, is a very tenuous and unsatisfactory basis from which to draw our early American inhabitants. We have too many facts that do not fit in with such mythical beginnings. The South Sea Islands, for example, we have already shown to be among the last places in the whole Pacific area populated by human beings, and yet these same islands are supposedly the remnant mountaintops of the continent of Mu.

As for the writings that purport to give the information of this fascinating land mass, such writings are only a few of thousands that tell tales of far-off places and unknown peoples and things. Among the peoples of Asia whose records have been preserved there are, for example, several dozens of versions of the origin of mankind. These various stories emanate from the individual tribes whose mythology they are. The tales tell of the first man's origin from several different directions and from specific sources varying from the mud of the Cosmic River to an egg from the all-divine tortoise.

There is no reason to believe that the legend of the Lost Continent of Mu has any more to it than have any of the other origin legends of Asia or Mexico. What we seek is concrete bone and flint evidence of how and from what

direction man first arrived in these woods and plains. Conjuring up lost continents from the depths of oceans only complicates and confuses a problem that is already difficult. Mythology and Folsom man are many thousands of years apart.

With the growth of science in the more enlightened years of the last few decades, a number of explanations of an archaeological nature have been offered to explain the origin of the American Indian. Around the early 1900's there was a school of thought which hoped to demonstrate that all the peoples of the New World and their culture were derived directly from Egypt. Egyptian antiquity had become a fad, and the New World was stuffed willy-nilly into that difficult category. The mysteries of Egyptian religion seemed so delightfully occult and unknowable that this also was put forth as an explanation for the origin of all civilization. Man's beginnings were traced back to the halls of Horus and Osiris, and fact and fiction were mingled in a *mélange* that would shame a fairy tale. This again was a very human attempt to explain difficult facts by delving into the unknown.

Chinese antiquity enjoyed a brief vogue at about the same time. Everything purportedly originated in China and thence spread its enlightening influence to all other parts of the world. This idea was aided and abetted by the fact, already mentioned, that American Indians look somewhat Asiatic and certainly have some connection with Asia. Chinese influences and the sculpture of India were seen on

every Mayan temple. Even Mayan and Mexican hieroglyphics were supposed to be Chinese or Asiatic. The Mayan language was supposed to be Chinese in origin and the two languages to be mutually intelligible. Such ideas were even disseminated from authentic lecture platforms by no less a person than a Harvard professor. It was several years before it was demonstrated that Mayan and Chinese have no more connection than have Hindustani and Brooklyn English. Some long-forgotten Chinese mandarin would certainly not serve as the progenitor of Folsom man.

Deriving people and the things they made from continents far across ocean waters is demonstrably difficult. Even with the convenient aid of a lost continent or two thrown in to partially bridge these salt-water wastes, such transitions are difficult, especially as there is little, if any, evidence to back them up. Of course, Folsom man was not known at the time these theories were in mode, and his discovery, among other things, put an end to such unscientific fads.

Then too, numbers of writers sought to derive the American Indian and his ancestors from celestial sources in the Old World, giving as reference recent religious works and the testimony of religious teachers. Some of these religious arguments went so far as to state that man had originated in the New World and had then spread back in the other direction to populate Old World centers. This is simply mental drop-the-handkerchief and explains nothing. The vast accumulation of scientific evidence indicates unequivocally that man originated in the Old World and thence

spread to the continents of North and South America. That spread may be explained in a logical, concrete, and demonstrable fashion. The religious writings often used in support of arguments concerning these matters had no scientific background. Many of them were written in allegorical form and were never meant to be used for other than the religious teachings that they contained.

We have explored, then, numerous directions of the compass for the possible source of Folsom man. If he did not originate in the plains and valleys of New Mexico, where then did he come from and how? The fact that he was there is indisputable. The time that he was there is fairly well ascertained. His mode of life at that particular time fits in well with the evidence we have from Europe, Asia, and Africa. In spite of the fact that New World hunters lagged far behind their Old World cousins, the connections are obvious. But where can we find those connections? How can we demonstrate beyond a shadow of a doubt the route of entry into the New World? The problem is a clear-cut one. The answer must be a piece that fits the puzzle, not a solution that creates another puzzle. No legends, no lost continents, no fairy tales will suffice. We want evidences of the very first men who ever saw these new lands. We want those evidences incontrovertibly to demonstrate how and from what direction these first men came. Where can we find proofs that will stand?



CHAPTER 6

Bering Strait—Front Door to America

INTO THE MUSEUM OFFICE, one afternoon, there limped an old miner leaning heavily on a warped crutch and carrying his five-gallon hat in his hand. Miners are always interesting, and this one was especially so. He spoke not only of gold but also of bones and flint points. Fossil bones and flint points was a combination of information that never failed to elicit the most profound attention on our part.

Sitting knee to knee with us in the dark office, he told his story, a story of cold and privation in the search for gold in Alaska, far from his native New Mexico to which he had returned to recover from severe frostbite. He had mined all over Alaska with the foremost of those who went to the

Yukon in '98. Recently his diggings had been near Circle, Alaska, a town so named because of its location on the Arctic Circle. Here, in a deep pit in the Alaskan muck, he had encountered masses of dark-colored bones of animals of gigantic size. Here and there the miners had picked up a flint point among the bones. Were we interested?

As a matter of fact, the crippled miner was not the first one to draw our attention to Alaska. Almost as soon as our quest for the first American had begun, a number of occurrences had focused our researches in that direction.

By merely looking at a map of the American Hemisphere, the region of Alaska appears as the most likely spot for the entry of man into the New World. We have already seen that other routes of immigration were impossible or extremely impracticable. As man did not develop in North and South America, we obviously must account for his appearance in these regions in some logical manner. Such geographic finger-pointing on the atlas inevitably draws us to the area of Bering Strait.

This strait represents the closest contact of North America with any other Old World land mass. This salient fact was recognized a very long time ago. In 1724, Peter the Great sent a Dane named Vitus Bering to see if Asia and America were joined. Vitus Bering and his officers had not actually ascertained that the two land masses were not one when the explorer died in those same inhospitable regions.

Only 56 miles of water separate the continents of Asia and North America at their closest point. Even this stretch

of water is divided by the Diomed Islands, two tiny hillocks of rock that lie almost in the middle of the Bering Strait. With the Diomed Islands as steppingstones, it seems logical to suppose that man may have entered the New World by this route. Were logic and handling the outline gazeteer our only methods of introducing man into the Western continents, we would be on tenuous ground, indeed. There are other, more telling, arguments.

With our original discovery of the Folsom hunters in New Mexico, we also found certain indications which demonstrated that Folsom times were coincident with phenomena accompanying the great continental glaciation that closed the so-called glacial era. We had already become familiar with calculations of this sort by our researches in Europe. There, the history of ancient man is interwoven with the advances of the great continental ice sheets. These were far from inimical to man, for apparently, around their outskirts, man and the animals upon which he lived flourished. Indeed, it is these same continental ice advances and retreats that give us our best chronology of those remote times. We have now come to expect evidences of rainy periods—long-dried-up rivers and lakes—wherever Folsom man or other early men are concerned.

When we consider the Bering Strait area in the light of our glacial knowledge in those regions, the results are tempting to contemplate. If we had, for example, tremendous masses of ice gathered around several centers on the North American continent, representing cubic contents of astro-

nomical proportions, very considerable amounts of the moisture content of the oceans of the world would be tied up therein. To illustrate this we have, of course, a glacial ice cap covering the region of the Antarctic Continent at the present time. From our limited knowledge of this present-day glacial mass, we can gain some idea of what the continental glaciations were like in North America ten or fifteen thousand years ago. If the ice in the Antarctic glacial cap were distributed evenly around the world, there would be enough frozen moisture to provide a layer of ice 120 feet thick over the entire globe! From almost inconceivable statistics of this sort, we can gain some idea of the masses of ice involved in these world-wide glacial phenomena.

We can, then, presuppose a reduction in the levels of the oceans during the height of the glacial periods. As the waters of the Bering Strait are comparatively shallow even now, it would take very little such reduction to make the Straits dry land and to connect Asia and North America with an actual land isthmus. There is little doubt that this was the situation only a few thousand years ago. Even though this land bridge might have been broken by fluctuations of glacial masses and seacoast lines, there was at least ample opportunity for men and animals to cross from one place to the other. That this was actually the case, we can now demonstrate.

At the present day the ice becomes thick in the Bering Strait in October of each year and freezes over completely soon afterward. Eskimos from the Siberian side trade freely

with Alaskans during these winter months, and a lively traffic of dogs, men, and sledges moves back and forth across the ice. If ancient men did not walk dry shod over a land isthmus, they could easily do so over the winter ice.

Glacial considerations, also, are important in Alaska. What if some intrepid hunter of ancient times had found his way through the front door to America only to find himself confronted with a tremendous ice mass barring further progress? If such had been the case, no Folsom man, nor any other early hunter, would ever have been discovered on the New Mexico plains.

Geologists have now mapped with fair certainty the extent of the ice masses of the glacial periods. In spite of the fact that we usually consider Alaska a land of snow and ice, we are perhaps surprised to find that it was little colder in those far-off times than it is today. Glacial masses in Alaska were confined for the most part to the edges of the Alaskan Peninsula and the mountainous areas to the north and south. The central section, including the Yukon Valley, was almost entirely open and ice free. As we have already seen, men and animals lived in close proximity to the ice masses and flourished upon the abundant verdure and the moist seasons that were a concomitant of the glacial periods. Physically, so far as we are aware, during most of the glacial times, a Folsom man might have walked comparatively unimpeded across the Bering Strait, up through the valley of the Yukon, and thence across to the valley of the Mackenzie River and down into the reaches of Canada.

The Aleutian Island chain has always figured in some of the arguments as to how man reached North America from Asia. Dr. Aleš Hrdlička, of the Smithsonian Institution, spent many years in archaeological researches in these islands, trying to discover if there was any basis to such a supposition. As the Aleutian Islands are volcanic and consequently unstable over periods of several millennia, man's entrance via these rough and stormy steppingstones seems improbable. Likewise, even with the tip of the Aleutians lying close to the islands on the Asiatic side, there are still many miles of open sea which would have to be traversed in something like a fairly seaworthy boat. Then, too, we must not forget that we are dealing with hunters whose only weapons were the few flint tools that we have discovered on their camp sites. It is foolish for us to contemplate that these first Americans had anything more seaworthy than a log that they might straddle from time to time to cross a river. By all logical accounts, the Bering Strait region is the most favorable spot to look for the first footprints of the newcomers to the western world.

We had discovered, too, in our researches throughout the Southwest and the Great Plains area of North America, that Folsom man was to be found over a considerable area. The Folsom territory, we had discovered, embraced most of the western reaches of the Great Plains. Notably, as an outgrowth of newspaper and magazine articles on the discovery of these ancient men, a number of letters began to

come in from out-of-the-way places from persons who claimed to have Folsom points in their possession.

Certainly one of the most outstanding features on the whole Folsom story is the fact that the Folsom points can be recognized out of context. They are so distinctive that when a rancher or a farmer writes in that he has found a Folsom point in the creek valley behind his house we are fairly certain that he has done so. Most of our information as to the spread of Folsom man came from sources such as these.

Among other sources of information that looked extremely promising was a series of letters that kept dribbling in, early in the 1930's, from the plains region of Canada. South-central Saskatchewan seemed to be a concentration point for these indications of Folsom remains. Scientists from the Smithsonian Institution and from the University of Pennsylvania made special trips to the regions of Saskatchewan and Alberta to see whether the indications of Folsom man were as favorable on the spot as they were by mail. The stories proved to be true. The ranchers had in their possession some dozens of bona fide Folsom points. This could only mean that Folsom man had passed that way.

This was a tremendous step in the tracing of the earliest hunters on this continent, even though we were doing that tracing backward. If we could follow the tracks of Folsom man back to their source, we would find his point of entry

and probably also discover his time of entry into the New World. This is what we wanted—absolute proof of the advent of humans into these regions. We had found the end product; now to discover the route by which man came.

There were other glimmerings from the region of northern Canada and Alaska. In the tremendous gold pits in and around Fairbanks, Alaska, great quantities of fossil bones came to light. So many were discovered that paleontologists were attracted to this region more than to any other. In the Plains area, and in other locations in North America where fossil bones have been found, they usually turn up in small quantities and in fragile condition. On the Folsom sites of Colorado or New Mexico, a good skull of a Taylor's bison or a passable mammoth tusk is jacketed with plaster of Paris and carried back with loving care to the museum laboratory. It was astounding, then, to discover in the gold mines of Alaska bones of extinct animals in unbelievable quantities and sound condition; in some places, even, they were an actual impediment to mining.

These bones are found all over the central region of the northern Alaskan Peninsula embedded in the typical Alaskan "muck." As the gold-bearing gravels lie beneath this muck, the miners find themselves, of necessity, digging pits and shafts through the muck to get at the gold beneath. As the muck is eternally frozen, it is not only a great impediment to gold-mining operations, but is also a wonderful preservative for any animal remains that might lie within it.

In many places the Alaskan muck blanket is packed with

animal bones and debris in trainload lots. Bones of mammoth, mastodon, several kinds of bison, horses, wolves, bears, and lions tell a story of a faunal population, which is the type of background we would expect in our search for early hunters. After all, if the animals were there, and the Folsom points were present, could the hunters be far away?

The Alaskan muck is like a fine, dark gray sand. It is very moist, is eternally frozen, and apparently has been so ever since the glacial age and the times of early men. Even in summer the ground thaws only about three feet down from the surface. Eskimo dogs in the warm Alaskan summers habitually dig shallow holes in the ground so that they may lie on the frozen muck beneath to keep cool. Within this mass, frozen solid, lie the twisted parts of animals and trees intermingled with lenses of ice and layers of peat and mosses. It looks as though in the middle of some cataclysmic catastrophe of ten thousand years ago the whole Alaskan world of living animals and plants was suddenly frozen in mid-motion in a grim charade. Here we do not have to reconstruct so much from parched and weather-worn clues and tid-bits. In the historical ice box of the Alaskan muck, large segments of the story of early men lie rigid and cold awaiting discovery. Is it any wonder that the old miner fanned our enthusiasm to fever pitch with his stories of bone beds stretching for miles beneath the mucks?

Throughout the Yukon and its tributaries, the gnawing currents of the river had eaten into many a frozen bank of muck to reveal bones and tusks of these animals protruding

at all levels. Whole gravel bars in the muddy river were formed of the jumbled fragments of animal remains. The picture was one of abundant animal life of a by-gone era. If it is a hunter we seek, why not look where the game was most abundant?

Even before the Alaskan deposits became known because of our gold-mining operations in those regions, other quantities of bone deposits of extinct animals were known in Siberia. As early as five hundred B.C., China was trafficking in fossil ivory tusks of mammoths from Siberia. Much of the early Chinese carving in ivory, which we consider so typically Chinese, was done with this fossil material, traded from the north. Thousands of pairs of mammoth tusks were exhumed in Siberia and sent into these trade channels.

Since the tusks were dug out and traded by wild native tribes, men of the untrammelled and unmapped wilderness of Siberia, little knowledge of the origin of the fossils was ever procured. It was not until the last few decades that Europeans paid any considerable attention to these fascinating remains. When they did, they found a story of extinct animals involving numbers almost beyond belief. It was estimated that along the rivers of northern Siberia lay buried the remains of some ten million animals of extinct varieties, whose death had been caused in some mysterious fashion.

The Alaskan animal deposits, as they were revealed along the banks of the Yukon and in the great muck pits of the gold miners, were but a continuation of these Siberian bone beds. The species of animals on both sides of the Bering

Strait were the same. In spite of our present nebulous knowledge of the Siberian side of the question and the muck deposits there, the situations were known to be similar. We had, then, a picture, on both sides of the Bering Strait, of a country teeming with animal life, which lived upon the abundant verdure growing in the moisture created around the edge of the glacial masses. If the first Americans were hunters, as Folsom man had demonstrated himself to be, this was a hunter's paradise.

Added to these considerations of animals, which we had talked over on more than one scientific occasion, were other more concrete clues. In the gold pits in the vicinity of Fairbanks, Alaska, a few flint points had come to light along with other rather vague indications of fire and human habitation. The flint points, unfortunately, were not Folsom points. A few of them were faintly reminiscent of the classic Folsom flint tip with which we had become so familiar in the Plains region. Some of the chipped pieces of flint that turned up in the muck pits looked like nothing we had ever seen before. Also, there was ever present the question of where the points had originated.

The muck blanket in these regions is from four to ninety feet thick. It is often difficult to tell, as the great hydraulic streams of water sluice away the muck, exactly where the flint points originated. If they came from the topmost layers of the muck blanket, they might be comparatively modern, or Eskimo in origin. If they were found deep within the muck layer, the judgment of greater antiquity was war-

ranted. Most of the flint points were tantalizing indications of what might be discovered among the bones of the extinct animals rather than concrete historical evidence. We were not absolutely sure that the hunters had passed that way, even though on every hand the bones of the animals they hunted could be found. Possibly the teeming mammoth herds of Alaska were so numerous and so mighty that man could not survive there.

On a previous trip to Alaska in 1933, we had stumbled into a curio store in Ketchikan, in the southern portion of Alaska most frequently visited by tourists. The musty smell of stale whale oil and old leather, typical of the curio store, is hardly the atmosphere for scientific discoveries. On this occasion, however, we pounced with unscientific shouts of enthusiasm on a flint point that lay among the litter on one of the store shelves. It was a Folsom point, finely chipped and with the typical channel groove up either side. The curio store proprietor, unlike most of his kind, knew where the point had come from!

"Sure, I know where it came from. Eagle Johnson, up at Seldovia, found it over on the north shore of Cook's Inlet. Paid him a candy bar for it. What's so different about it, anyway?"

A real Folsom point in Alaska! A real piece of evidence upon which we might hang the whole history of early man in the New World! There was nothing vague about this piece of flint. We would have to fit out an expedition and search the place of its origin. The old miner leaning on his

crutch was only one of the signposts pointing to Alaska as the original doorway to America.

Accordingly, in the early summer of 1941, in a chartered boat, we set out from the port of Seattle, Washington, loaded with scientific equipment and enthusiasm for the regions of the north. We more than suspected that Folsom man, if our calculations proved correct, had come down through North America by an interior route, probably east of the mountains. However, the waterway to Alaska is not only the easiest, but also the best, for a scientific trip. For our investigations, we could reach fairly conveniently almost any part of Alaska by water.

The first leg of the trip was north, along the coast, and thence by a short overland journey to the vicinity of Fairbanks. We would see for ourselves the great deposits of animal bones and discover, if we could, the traces of the early men who had lived in this animal world.

The immensity of the gold pits was certainly not disappointing, nor were, indeed, the tremendous quantities of bone material that we found in and around them. The hydraulic jets of water which the miners used in their modern gold-mining methods had sluiced away tremendous quantities of the overlying muck. In summer, beneath the short-lived Alaskan sun, the frozen muck masses dripped and fell away in sludgy masses. Within these oozing piles, the bones of mammoth, camel, horse, moose, and carnivores were everywhere in abundance.

Most remarkable was their preservation, which seemed

especially outstanding in contrast to the dry, chalky remains with which we were familiar in more southern regions. The frozen muck had preserved, in a remarkable manner, tendons, ligaments, fragments of skin and hair, hooves, and even, in some cases, portions of flesh of these dead animals.

In one location north of Fairbanks, a bulldozer was being used to push the melting muck into a sluice box for the extraction of gold. With each passage of the dozer blade across the melting mass, mammoth tusks and bones rolled up like shavings before a giant plane. As the sun melted the black ooze in and around the bones, the stench could be smelled for miles around, the stench of some hundreds of tons of rotting mammoth meat, ten thousand years old. Apparently, a whole herd of mammoth had died in this place and fallen together in a jumbled mass of leg bones, tusks, and mighty skulls, to be frozen solid and preserved until this day. Only the greed of man for gold had opened up their long-frozen grave.

Day after rainy day we walked the pits, and followed the bulldozers, and trailed the streams of hydraulic giants. We became satiated with discoveries of perfect bison skulls with horns attached, or of mammoth skin with the long black hair still adhering to it. Even these wonders began to pall on us, for we found in the muck and ooze and ditches no traces whatsoever of man. Frozen in the muck walls, or beaten out beneath the insistent pounding of the streams of water, were logs and twisted trees and branches and stumps.

Here and there were layers of moss and peat; but nowhere in the muck could we find a layer of charcoal, or a fire pit, or any of those other indications that we had come to associate with the camp sites of the ancient hunters. Mammals there were in abundance, dumped in all attitudes of death. Most of them were pulled apart by some unexplained prehistoric catastrophic disturbance. Legs and torsos and heads and fragments were found together in piles or scattered separately. But nowhere could we find any definite evidence that humans had ever walked among these trumpeting herds or had ever seen their final end.

On one particular rainy, dark afternoon, we were assisting one of the paleontologists in excavating the remains of an Alaskan lion—a great, striped beast with long fangs, slightly reminiscent of a Bengal tiger. He looked like a nasty customer in death, even though he was represented only by scattered bones in the black muck. As we sought for the lower jaw of the lion in a newly revealed surface of muck, we found it—a flint point still frozen solid in the muck bank. It was of pink stone, finely chipped and gracefully shaped, and undoubtedly made by the hand of man. Its position was about ninety feet below the original surface. We photographed it in place, then removed it from the frozen ground, eagerly held it up, and turned it over for inspection. We washed the clinging muck from it in the muddy water beneath our feet.

Although it was suggestive of a Folsom point, it lacked the channeled grooves that are so characteristic. We did not

know whether to be disappointed or elated. Three weeks' searching, and we held in the palm of our hand one flint point, which was frozen near the carcass of an extinct animal. It might even have contributed to the death of that Alaskan lion of long ago. There was no doubt that some man had been there. Was it the Folsom man? Or was this the ancestor of Folsom man who passed that way a thousand years before he reached New Mexico and had fended off a striped lion? Where were the bones of the man who made this flint point? We had tramped the muck piles for weeks, and nowhere in the welter of bone remains had we found a single human fragment.

There was still Eagle Johnson and the Folsom point from Seldovia. On the map the location of Seldovia does not look promising. It is a small fishing village on the very tip of the Kenai Peninsula of Alaska and would not seem to be a logical stopping point for any migration from Siberia into the interior; but it was the source of our one concrete piece of evidence.

We never reached Seldovia. One of those vicious storms that whipped in from the Arctic waters of the Gulf of Alaska drove us into a small harbor near the tip of the Kenai Peninsula. As our engines labored against the wind and we fought against the pounding waves to get our anchors out to hold us in the dubious lee of a small, rocky point, we could see through the driving sheets of rain and the gathering darkness a small fishing boat like ourselves seeking shelter. Two days we lay in this precarious position, fight-

ing against the elements. As the wind and spray subsided, we looked forward to a visit from the fishermen on the neighboring craft. Even as the foremost of these swung his dripping boots over our rail, we asked him the inevitable question:

"Do you know Eagle Johnson?"

"Eagle Johnson? Sure, I *knew* him. He's been dead for a couple of years."

Eagle Johnson dead! The word sounded like the end of an unsuccessful scientific experiment. Now we would never know. The one tenuous link that we had with the whole story was gone. But there was one more chance. We had in the cabin two or three Folsom points that we had brought for this purpose. We had shoved these points under the nose of every Alaskan we had encountered for just this reason. In most cases the fishermen and miners and prospectors who looked at the points had merely shaken their heads and said something like:

"Mighty peculiar flints. Don't look Indian to me."

On this occasion, however, with the rain of the dying storm still beating down on the deck and the points held out in our wet hands, we waited with more than usual expectancy. The foremost of the fishermen who had come aboard, looked at the Folsom points for a full moment. A shake of his head and our whole trip was a failure.

"Why, if you are so danged interested, seems to me I remember Eagle finding a lot of those flint points and bones over at Chinitna Bay."

That night we celebrated in our tiny cabin with our fishermen friends as though we had discovered Folsom man himself frozen in a solid block of ice.

Chinitna Bay lies directly across Cook's Inlet on the southern side of the Alaskan Peninsula. In distance, it is not too far from the Yukon Valley and the Bering Strait area. The bay, however, is within the volcanic belt which so characterizes the Aleutian area. Iliamna volcano, with a plume of white steam issuing from a vent in its side, towers above Chinitna Bay like a live sentinel. It is hardly a region where one would look for Folsom man. The Fairbanks bone pits seemed much more likely, but we had looked there.

In the shallow waters of Chinitna Bay, we could find only one place to anchor our small boat. A hundred yards distant from the anchorage on the west shore of the bay, a small creek flowed into the tidewater. It must have been here that Eagle Johnson and his fishermen friends had put in from time to time to get fresh water. With Eagle Johnson dead, we might have an extremely difficult time locating any evidences of ancient man in the tremendous area. It was with considerable doubt and many misgivings that we landed our skiff on the gravel beach and stepped out at the place we had come so far to examine.

Just above high-water mark, the tracks of a Kodiak bear skirted the driftwood and seaweed. At the inland side of the beach was a bank, eaten away by the waves and tides of just such a storm as we had experienced. The top of the beach

was strewn with stones and debris which had been washed out of this bank. We had not far to go.

Just as Eagle Johnson must have done before us, we walked up the beach near the mouth of a small, unnamed stream. The glitter of flint among the dull pebbles in the sand caught our eyes. There was a familiar shape among the litter of material at the bottom of the bank. It was as though we had never left New Mexico at all. There was no doubt about it. Lying face up, with its characteristic groove and outline revealed at a glance, was a Folsom point! We had found it—a Folsom point in Alaska, and in place. We had back-tracked Folsom man almost to his starting point. Our suppositions and logic had now become certainty.

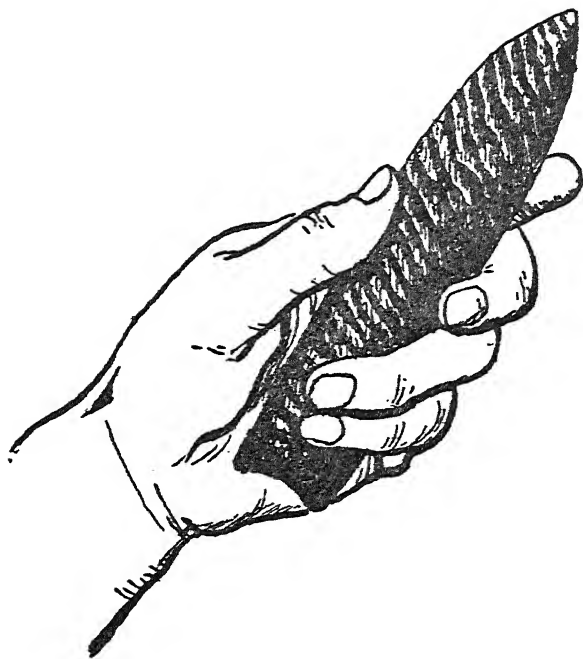
As we ranged excitedly up and down the beach, we found everywhere the chips of flint and bits of charcoal that indicated that man had been there. Protruding here and there from the bank, or shattered in sodden fragments on the beach, were the bones of mammoth. Mammoth gave us the time; the flint points gave us the picture. Here was a camp site of ancient men who had killed and eaten now-extinct animals. Up and down the beach the evidence was littered, concentrated in places, then for a few hundred yards represented only by a flint chip or scattered bone. In our hurried search of the first afternoon we found no human bones at all.

That night another storm struck and our small boat tugged and strained at the two anchors like a live thing. Three more days the tides and the wind raced in and out

of Chinitna Bay like elements possessed. Only a few short yards away was the place we had come so far to see, and we could not even get ashore.

On the third day we landed for a brief period to further explore the site and take some photographs. After a few hours the wind grew stronger and we got back to the boat just in time. That night a veritable gale shrieked over the water of the bay and churned the tips of the waves to driving pellets of water. Certainly, if the weather was as bad in Folsom times as it is now, there would appear to be no reason why any hunters had ever stayed there, no matter how good the hunting was. A week after we had come, we limped out of Chinitna Bay with great reluctance, but with the firm resolve that we would come back and excavate there in the near future.

What we had found in a whole summer's cruise to Alaska could be contained in an old hat. The implications involved, however, were epic-making. We had demonstrated that man came to the New World by the front door, across the Bering Strait, and had lived first in Alaska. We would have to search farther to find each one of his footprints as he made his way into the interior of Canada and thence down to Saskatchewan, Alberta, and the Great Plains. But the story was becoming much clearer. The first American was no longer a mystery.



CHAPTER 7

The Yuma Man

THE ILL WINDS THAT SCOURGED the ancient lake beds of Clovis breathed their hot breath on other places as well. Year after year the "dust-bowl blasts" abraded the desiccated soil from the face of the land. Droughts withered the grass and bushes that might have withstood the scouring air. Whole trees were uncovered to their roots, so that they toppled and lay as wooden skeletons while the winds blew away the soil that gave them life.

Top-soil accumulations of all the ages since the great glacial period were whipped into the air in a few short years. In places in Texas and eastern Colorado, more than 20 feet of dirt were blown away in less than 10 years.

The probing winds of the Great Plains were selective in these serious years. They searched out and scoured the soft sediments that lay in and around the ancient lakes and marshes of glacial times. The fine sands and loams of these long-since dried-up water courses fell first prey to the winds and were soon leveled away. Harder areas withstood the blasts and survived much as they had been before. The result was that of a pock-marked landscape with circular depressions or "blow-outs" interspersed with low plateaus and mesas of the original soil surface. The blow-outs often coincided with the ponds and lakes that had been filled with the dripping moisture of the glacial age.

The winds of the dust-bowl years uncovered the levels where ancient men had walked. Bones of the animals they killed were revealed in these places as the soil ebbed away. The bottoms of glacial lakes were scraped bare by the process, to reveal again whatever animal had accidentally drowned there or to show where ancient hunters had thrown their spears and missed to lose them in the water.

The winds that ruined thousands of farmers and ranchers in the late 1920's were a bonanza to the archaeologists. Not in a thousand years of digging with the mightiest of modern contrivances could these "playboys of science" have un-

covered so much even if they had known where to dig.

The blow-outs of the High Plains, then, brought disaster to the inhabitants and knowledge to the scientists. It was, however, not the scientists who first found that these wind-scooped hollows were valuable.

There had developed, especially in eastern Colorado, a pastime somewhat different from amusements in other parts of the country. It seemed as though these hardy people, many of whom had lost their ranches in the dust storms of these awful times, had sought to find some amusing side, some happy facet, to what was otherwise a very dark future indeed. When their cattle thinned and died and their homes were buried by the drifting dust, they amused themselves by searching the blow-out depressions for "relics" and whatever else the winds might have left there. As the breezes blew away the powdered dust from the bowl-like hollows, all heavy objects were left on the spot. The finely divided soil acted much like water, which, when drained away, leaves stones or heavy material on its bottom. Pebbles and flakes of flint were dropped in place after the dust had moved on. Many bits of past history of the land were revealed in this manner.

For example, out of the enveloping dust of a single blow-out in western Kansas emerged a saga of the early frontier such as would delight the heart of a pulp-magazine writer. On a certain spot some ranchers, searching the blow-outs after a particularly vicious dust storm, found four bodies,

or rather skeletons, weathering out of the blowing sand. Two of these were obviously Indians and the other two were equally identifiable white men, with the tattered fragments of Federal uniforms still upon them. Carefully revealed by the winds were the patinated insignia of the U. S. Cavalry to which the two men had belonged, and to one side lay a saber and an eroded canteen. What made the find truly remarkable was that the four figures, two Indians and two whites, had died by violence in close combat. Two of the skeletons were still locked together and the wind-whitened bones and dried ligaments of the one intertwined with the other. A Bowie knife and rusted hatchet lay on the dirt beneath their ribs. There was no doubt that one had destroyed the other.

The other cavalryman was sprawled on his face with his skull split and cracked by a rifle ball. All that remained of him was a shock of dark brown hair on a skull fragment and the nails from his square-toed boots. The second Indian lay on his back to one side with no mark whatsoever on his bones. The quadruple tragedy was but an incident in the frontier days. Two cavalrymen had evidently been ambushed by a group of Indians in a buffalo wallow, but as they died they had taken two of the red men to their graves with them. Apparently no one had seen the tragedy. The soldiers had simply disappeared into the vastnesses of the plain and had never returned. Two Comanche braves had gone out on the warpath and thence to the Great Beyond. Possibly no human had known what had happened until

the winds had blown the soil away from their bones to reveal again the last resting place of the four in the old buffalo wallow.

Iron arrowheads, copper kettles, iron wagon tires from long-forgotten wagon trains, were to be found in the blow-outs. In the bottoms of these bare, grassless basins any object stood out as definitely as a cake of soap in the bottom of a bathtub. Indian arrowheads of all descriptions lay in the blow-outs by the thousands. Long-buried campfires and pottery vessels were revealed. As the soil rolled away, the odds and ends of many centuries were left bare to the human eye.

It became the custom, then, for ranchers and businessmen alike to search the blow-outs on Sunday afternoons for what they might reveal. Picnicking parties were arranged for these trips, and seldom did the clientele come back empty handed. Especially after a particularly marked period of high winds, the interested amateurs combed the series of blow-out depressions to see what new treasures had been revealed. Boy Scouts made yearly bivouacs in the areas to collect antiquities. Probably more Indian arrowheads and knives and axes and other remnants were collected in this manner than from any other source at any other time.

As these relics began to accumulate into thousands of individual specimens, some outstanding facts became apparent. The arrowheads seemed to divide themselves into various categories or varieties. The iron arrowheads were,

of course, those traded to the Indians by the European frontiersmen. Other barbed, rather broad-bladed points could be definitely ascribed to known tribes, such as the Utes and the Comanches. Many other types of arrowheads and knives seemed more obscure in origin and variable as to type.

With the discovery of the Folsom site in northeastern New Mexico, many of the collectors in Texas, Oklahoma, Colorado, and Nebraska immediately conned their collections to see if Folsom points were among them. A satisfying number of classic channeled Folsom points were thus revealed. It was in this manner that the Clovis site in eastern New Mexico was discovered.

It came to the attention of some Colorado scientists that a number of flint points in eastern Colorado were different from the rest. These points had come to their attention because they were the most coveted by collectors. This was especially true of a type of flint spearpoint totally different from the Folsom. This new type of point was very large, as points go, as they often reached 6 or even 8 inches in length. In shape, they were long and slender, with parallel sides and a straight or concave base. The flint chipping on these outstanding pieces was remarkable. The flakes were as even and rippled as the sand on the bottom of a pool. There was no doubt that they had been made by master craftsmen, but the question was, what master craftsmen? As large numbers of these long, slender points had come from Yuma County in eastern Colorado, they were called by that name.

Yuma points soon came to be as well known as Folsom points.

During the 1930's, Folsom points and Yuma points were the two most highly prized collectors' items. The supposition that Yuma points and Folsom points were connected did not arise, only because they were both coveted by collectors. As the men of Yuma County scoured the blow-out pits in their particular area, they often found Folsom points and Yuma points in the same depression. In several instances, good, classic Folsom flints were found within a few inches of typical Yuma ones. Although the shapes were totally different, both types of flint weapons were superbly made. The Yuma chipping was adjudged to be among the finest in the New World. The Folsom point was certainly one of the most complex of flint implements. Could the same men have made both?

As we have said, the blow-out depressions were a remarkable source of ancient lore. Without the information and revelations of these antiquities, the Yuma points might never have been suspected, and many Folsom sites probably would not have been discovered. There is one outstanding difficulty with the blow-outs, however, for our purposes as antiquarians.

As the soil drifts away before the boiling winds, all heavy objects are left behind. The green, patinated brass buttons of the soldier locked in death with the Comanche Indian are left side by side with a flint arrowhead that may have been shot on the same spot centuries before. An iron kettle,

dropped from a fleeing wagon in some Indian raid of 1850, may have settled beside the tusk of a mammoth which died thousands of years before Europeans suspected their existence on the North American continent. The objects are revealed, but the chronology is not. When the dust blows away, all of the heavy material seeks a common level. Flint and stones from the level of the grass roots sink down and lie side by side with the Folsom points that may originally have been buried under many feet of soil.

This difficulty was not realized for some time. Enthusiastic describers of the Folsom people considered for several years that the Yuma points may have been made by the same men. It was suggested that Yuma points were used by Folsom men as knives, or that, by sheer whimsy, Folsom men made and shot channeled points on some occasions, and then Yuma points immediately afterward. But it was finally decided that the long, narrow, ripple-flaked Yuma points are a far cry from the grooved and pointed Folsom points.

As man is essentially a dirty animal, he also is an animal of habit. He does things in a single way and most of his changes are comparatively gradual. If his father showed him the complex method of making a Folsom point and of delicately striking out the channeled chips that produced its characteristic, bayonetlike form, the son would chip flint like the father. It is impossible to conceive of an ancient hunter making a Folsom point today and a Yuma point next Thursday. We have already seen that Folsom points were so

distinctive that we could trace their owners by this one form alone. The conclusion was inevitable—the Yuma points were made by other men.

The Folsom symphony, whose beginning we found in Alaska and whose crescendo we described on the High Plains of North America, was disturbed, then, by a discord. The Yuma note was out of harmony. In spite of the fact that the points were found side by side in the same blow-outs, they did not fit. The Folsom question we rounded out in a fairly satisfactory manner. The Folsom men came across the Bering Strait hunting the great herds of animals that lived around the edges of the glacial masses. They followed, in their hunting status, these same herds of mammals up the valley of the Yukon and thence over into the valleys of the Mackenzie and its headwater tributaries. The Folsom men and their women hunted their way down through the plains of Canada and thence to the Great Plains areas where we first discovered them. They reached their fullest development in the south. But what of the Yuma men? Were they a Folsom offshoot or were they another tribe who lived at the same time as the Folsom people? If our story is to be a coherent whole, we must leave no tantalizing offshoot such as this unexplained.

Certain scientific men sought to explain the Yuma question by logic. As the characteristic flint point that the Folsom people made was so highly developed and so technically specialized, the scientists reasoned that it must have precedents. Surely such a development could not be funda-

mental; there must have been forerunners, earlier types of flint implements, earlier improvisations. In Europe, of course, such developments had been traced with a satisfying certainty from the crude pointed fist axe of the earliest dawn men. His flint implements had been followed up through a succession of improvements; but here in North America, our earliest inhabitants displayed not a crude implement, but a highly finished one with several characteristics that were far from primitive and far from fundamental.

The Yuma point lacks the channeled groove of the Folsom point, therefore it must be earlier. The Yuma men came into North America first and were followed by the Folsom men. That was the theme of the scientists' song. In logic, it was good. However, we have already seen that logic is thin ice, indeed, to support the earliest history of this country. The only way to fill out our story is to dig up the tell-tale pages of history and put them together in indisputable sequence.

For many years the Yuma question was hotly debated. No archaeologist meeting of the 1930's failed to bring forth arguments on this subject. It was pointed out that Yuma points were found to the exclusion of Folsom points in certain areas of eastern Colorado and eastern Wyoming. In other places, Folsom points alone were found. However, the two types of flint tips were often found together. The blow-outs swelled the collections of enthusiastic amateurs. But obviously no single blow-out was going to solve the mystery of the Yuma men.

It is remarkable how many thousands of Yuma points turned up in the 1930's without any specific evidence that would help. Practically no collection throughout the blow-out area, and continuing on up into the plains of Canada, was without a Yuma point or two. Those around Yuma, Colorado, numbered hundreds, if not thousands. Yuma points became so famous that collectors in the east, and even in foreign museums, vied with one another for their possession. A good Yuma point, with the characteristic fine chipping, might bring \$75.00 or \$100.00 in the amateur market. But, although the price of the Yuma points rose, their historical significance did not increase. In 1936 the true position of the Yuma men was as much a mystery as ever. A rancher, searching for flint relics near the small town of Eden, Wyoming, gave us the first real clue to the story.

The valley of Eden, Wyoming, is in places a dry and austere spot. At the present day, shifting sand dunes alternate with low, grass-covered hills, interspersed with typical blow-outs. In places, the winds of the last few decades have dug deep in the yielding soil. In other spots, the original strata remains comparatively undisturbed. In and around the edges of the sand dunes and blow-outs an Eden Valley rancher picked up several of the long but carefully chipped Yuma points that were now known so well. Had this man merely added these to his collection and put them in the attic, the Yuma men might still be considered our lost cousins of the Old World. If the rancher had simply sold the

points to some eastern fancier and pocketed the money, we would be none the wiser and history none the richer. Instead of taking the easy way, the man wrote to the University of Pennsylvania and asked some scientists to come to Eden Valley to see if the source of these Yuma points could be discovered.

And so, in 1940, just before the war, a party from the University Museum of Philadelphia visited the little-known valley of Eden, Wyoming, to make their investigations. Yuma points there were in abundance, and some of them were obviously eroding from the sides of strata and levels that were undisturbed. Most important of all, however, was the fact that from these same strata bison bones protruded. The white, fossilized bones of these ancient animals were a surety that the place had been a camping site of men and doubtless would produce the evidence that had been sought for more than ten years. If Yuma men had camped there, they had undoubtedly left their dirt and debris to tell their story.

In 1940 and 1941, the Eden camp site was uncovered. The story that was laid bare there was one that we have now come to expect. What is now a desiccated valley, laced with dry water channels, was in those far-off times a series of pools and marshes with lush grass and bushes around their edges. In the cross sections on the sides of the excavations, the black earth lines that show where grass and verdure lived are plain to see. The bones of animals and the flint points of men lie above and below them.

At first glance it might seem that the Eden Valley site told a simple story. Here were Yuma points associated with bison bones, just as at the Folsom spot. It would seem that the Yuma men lived at the same time as the Folsom men and hunted bison in the same way. We might expect, then, that the story of the earliest American was a double-barreled one. The Yuma men and the Folsom men lived cheek by jowl, and we might even expect that they stole each other's women as men always did. But the tale was not so simple as that. As we dug down through the crumbling layers of the Old Eden Valley we found discords within discords. The story of ancient man is seldom a simple one.

There were two layers of ancient soil on the Eden camping site with an area of sand between. It looked as though the valley had been lush and green at one time and had then dried out. This era had been followed in turn by another wet, rainy era, when the grass flourished again and the trees grew.

The bones and the debris of man lay among them and were found between the two soil areas of the camping spot. Deep down beneath all this accumulation of debris and climatic history were other layers obviously laid down in a wet period. The geologists who accompanied the expedition pronounced the Eden camping site as later than the Folsom and coincident with the last vestiges of the glacial age. Eden times were early modern times. The Yuma man, so the geologists claimed, was not so old after all.

The bison bones, among which the Yuma points were

found, were our next best evidence. We have already seen that animal bones in themselves tell a story. Even though the flesh and the skin and the hair and the hoofs have long since dropped away from the bone structure, the animal yet retains its characteristics. The experts who accompany the archaeological expeditions can tell the foot bone of a horse from the foot bone of a camel with as much certainty as if they were seeing that member in the flesh. These distinctions may be made even more final. A Taylor's bison may be recognized and differentiated from a modern bison even though only one good bone of the animal exists. The animals are extremely distinctive in their bony structures, and this type of evidence is constantly used. The bison bones from the Eden site gave the last conclusive evidence that we wanted. The paleontologist raised his head where he knelt in the pit beside a welter of whitened bones and said in a disappointed tone:

"Why, these aren't Taylor's bison. They're a more modern variety."

This redoubtable man evidently thought he was pronouncing an end to our hopes and our expedition. As a matter of fact, that single identification clarified at one stroke what had been obscure for ten years. The Yuma men who made the long, slender, finely chipped points lived much later than Folsom men and probably had little connection with them. It is true that both of these hunters killed bison, but the Taylor's bison that the Folsom men slaughtered

lived some thousands of years before the more modern variety of buffalo that attracted the Yuma men.

There is no doubt that the Yuma men lived on this continent a very long time ago. We may regard them as the descendants of Folsom men; or possibly the Yuma hunters came over from Siberia in a later wave of hunting enthusiasm, thus following in the footsteps of their Folsom predecessors. Their ways of life were obviously similar, but the time cadence of the story is now abundantly clear. The Folsom men were first, the Yuma men second by several millennia.

However, we must not congratulate ourselves too soon or too vehemently. Inherent in the one-time mystery of the Yuma men are several side mysteries which have not as yet been cleared up. One of these is the fact of the extinct and nonextinct types of bison. Why should one form die out and another form take its place? The transition, from all that we know about it at the present time, was not gradual. The Taylor's bison became as obsolete as the Folsom point. It was then replaced by modern bison, killed by Yuma men making a different kind of flint point. The sequence is clear; the "why" of the succession is not at all clear. Possibly some of our researches in the future will clarify this obscure side mystery.

Yuma points have been found in Alaska. As a matter of fact, the point that we recovered near the carcass of the Alaskan lion was reminiscent of the Yuma form, and yet this

point in Alaska was buried almost 90 feet deep in a solidly frozen bank of muck and was actually touching the bones of the vicious Alaskan lion that has not lived in the valley of the Yukon for ten thousand years. Why should a Yuma point be found with an extinct mammal in Alaska and with a modern form of animal in Wyoming? Did the Yuma men linger long in the northern regions and only filter south in later times? Did the Yuma men meet and conquer their earlier Folsom predecessors? Possibly this contact and conflict was the first war ever to be fought in the New World.

But such fantasies are at the present time out of order. We have solved the mystery of the Yuma men, it is true. We know that they lived later in Wyoming and the Plains area than Folsom man, but their beginnings are still obscure. As we play the Folsom symphony, we still have to deal with the underlying Yuma melody. It is still not completely melodious in all particulars. We may have to travel to Alaska again to track down the Yuma question as we did the Folsom question before it.



CHAPTER 8

Ancient Country Cousins

ANTIQUITY IS NOT ALL BONES and flint. Plain dirt is involved also. As the great animals

that Folsom man hunted became extinct, there were other changes as well. The pluvial rains of the Glacial Age drizzled to a halting close to be replaced by the low moistures of the present day. The lakes and ponds that ancient man had skirted shrank to puddles and then disappeared altogether. The lush bushes and grasses that had attracted the mammoth and American camel withered with the coming dryness. Terraces of Folsom times which had been grassy glades now became bare dirt banks. Rivers that had been obstacles to man and mastodon now turned into expanses of grassless flats with a trickle of water in the center. With the vegetation desiccated, the surface of the land was ripe for change.

With the occasional torrential showers of the closing phase of the Glacial Period, the bare earth of Folsom landscape was washed away by the millions of tons. Ephemeral streams and gullies became rivers of mud. Many a Folsom point and mammoth tusk must have been sluiced away in the process. But many others were covered up. The sediments washed from the ridges into the valleys and from the valleys into the lower valleys. This was the way the ancient camp sites were buried so deeply. This washing process was the agent that changed the contours of the Lindenmeier Valley and covered the original Folsom vale with 20 feet of accumulated earth. Camp sites and animal carcasses were covered indiscriminately by the layer of wash. Those on high ground were destroyed; those in the valleys and hollows and swales were covered over not to be resurrected for ten millennia to come.

It was as though the cosmic forces of nature had, at the

end of the age of extinct mammals and ancient hunters, pulled a covering blanket over the landscape to hide all of their traces. It has only been occasionally and by accident that corners of this blanket had been turned back or torn away so as to reveal the story of ancient man beneath.

The drought of the dust-bowl years was one of the forces that pulled away the edges of the covering blanket of overlying sediment. Here and there over the expanse of the landscape, gullies and rivulets cut down through this soil cover to reveal, by accident, a camp site or a layer of bones or glittering flint to attract the casual rancher or the assiduous scientist. We have now come to expect a layer of overlying earth on top of these ancient sites, and we measure to some extent their antiquity by its thickness. Thus, if we see a layer of charcoal in a river bank, we may suppose that the fires that caused it were built there a very long time ago. In most cases, it takes many centuries to build up these considerable layers of sediments.

Deeply buried sites are, then, almost always ancient. More modern Indian accumulations may be found on the surface or just below the present-day grass roots. Indications of an ancient type of man, country cousins of the Folsom men, were found and brought to the attention of the scientific world simply because they were buried so deeply as to attract notice.

The first of these occurrences came to light near the town of Abilene, Texas, in a creek bank where the water had cut down through soft accumulations of loamy earth. A doctor, wandering along the stream bed and examining the clean

face of earth that had been revealed by the cleaving action of the water, noticed lenses of charcoal and pieces of stone protruding from the even, fine sand of the bank at a very low depth. As he casually pulled one of these stones from its position in the bank and brushed it off against his trouser leg, he thought much along the lines that we have just followed. As he turned and glanced at the 40 feet of bank that overlay the spot where he stood, the idea that the stone had been deposited there a very long time ago seemed most natural. Imagine the centuries required to pile up such a thickness of earth. The thought that the stone had been worked by the hand of man fostered the idea that extremely ancient men must have lived on the spot before the overlying sediments had been deposited there. Who could these men be but Folsom men or their contemporaries?

The discovery of the Folsom bison quarry had enlivened all antiquarians to the possibility of other finds. As a matter of fact, this stimulus was so consuming that ancient man seemed to be turning up in every cornfield. A great many of these finds turned out to be not so ancient after all. But some of them did seem to stand the acid test of real antiquity. The finding of man-made implements in river banks near Abilene at such tremendous depths below the surface did seem to be indicative. Possibly these man-made flints were even older than Folsom.

The doctor who had made the find, an avid archaeologist, spent his week ends and his weekdays, to the detriment of his practice, in pacing the streams and gullies of the vicinity in search of other evidences. Here and there, along the dirt

banks that the water had cut away, other implements came to light. Flecks of charcoal, bits of bone, flint weapon points, scrapers and knives, filled his pockets as he walked along. Many of these he pulled from the bank itself, and so there could be no doubt about their original depth. Others he picked up from the stream bed where they had washed out of the sediments.

Unlike other living places of ancient man, bones were comparatively scarce, although here and there a mammoth bone or a camel jaw weathered out of the dirt in the same general level as the flint implements of human manufacture. There were no such bone piles as characterized the Folsom hunters. Most of this evidence seemed to be from transitory, overnight camping places along the courses of streams and rivers.

In a few months the Abilene archaeologists had amassed a considerable collection of these interesting implements, all gathered in the same way from the banks of the rivers in the region and all at very considerable depths below the original surface. Newspapers of the time touted the finds as "the first Texan" and characterized the early men as being the most primitive inhabitants yet discovered in North America. A Lone Star variant of the earliest American did seem to be in order, but his exact relationship to the well-established Folsom men was slightly obscure. If these fellows hunted now-extinct animals, as well-regulated early hunters should do, where were the bones of their kills? Ancient men all over Europe, Asia, and Africa had collected bones and debris in camp sites in the same way as had

the Folsom men. These Abilene variants apparently had had different ideas.

Some of the flint implements drawn from the banks of the Texas streams were points obviously intended for spears. If these were Folsom points, we would have practically no problem. The Abilene points, for so they were called, have not the remotest similarity to Folsom points, nor, for that matter, to Yuma points.

The Abilene projectile tips are for the most part rudely made, roughly flaked out, and with a general leaf-shaped outline. One particular variant that turned up in the Abilene collections with great regularity has a generally slender stem with a thinned base but is so crudely made that any respectable Folsom man would have been ashamed of it. The points were obviously made to be hafted. The hafts were obviously spears or lances. This is quite as we would expect, and we would also conclude that the Abilene men were hunters; but what did they hunt? If there had been large deposits of mammoth bones in among the flints, their part in the early American picture would be clear.

In addition to the Abilene points with their unimpressive shape and outline, a large number of flint flakes, very roughly chipped scrapers, and fist axes turned up in these same levels. The fist axes are faintly reminiscent of the earliest European instruments and were doubtlessly used in the same way. The fist axe, we remember, was the earliest implement used by prehistoric man in the Old World. On this basis, the Abilene men would seem extremely early. However, with the fist axes are also found the crude

weapon points which show that the Abilene men used a thrusting and throwing spear as well. Judging from the rough and ready weapons of these men, we conclude that they were benighted country cousins and not necessarily extremely early Americans.

The question of the exact relation of the Abilene men to the Folsom men was so intriguing that all the forces of science were called into play to solve it. Geologists with their testing hammers, and botanists and archaeologists of all descriptions, tramped the wet creek bottoms and picked and hacked at the earthen banks of the streams gathering evidence to support their varying claims. Geologists pointed out that two distinct sets of sediments, one above the other, could be identified on these stream banks. Archaeologists proffered the information that there were a whole series of implements with various kinds of spear points and various kinds of flint choppers and scrapers and flaked knives in a certain sequence, one above the other.

The creek banks of Abilene were like an ancient cupboard with the oldest implements on the bottom shelves and the more recent ones on higher and higher levels. By cleverly tracing the shelves of this ancient cupboard from creek to creek in the Abilene region, a certain implement could be fitted onto the correct shelf with fair certainty. Even now it is possible to walk these water courses and pick these ancient flint implements out of the dirt banks at practically any level. That such an ancient cabinet with its various shelves existed is abundantly clear; but the question as to just where this cabinet fits in the ancient furniture of

prehistoric man is not quite so lucid. The Abilene men who made the crude, rough points of the lowest levels of this sequence may well have been poor cousins of the Folsom people. If they were, they were provincial and benighted indeed.

Texas may not lay exclusive claim to Folsom relatives. California has in recent years also entered the field. Whereas in Texas the Abilene men were revealed by the cutting action of Texan streams eroding down through many feet of soft sediments, the discoveries in California were brought to light by a complete absence of moisture.

There are in southern and southeastern California a number of forbidding and desiccated spots. Of all these, none is quite so austere as the Mohave Desert, now only in demand for movie sets where complete barrenness is demanded. The Mohave Desert is hardly a place where one would search for evidences of man, ancient or modern. However, such evidences have been found, and these were in the most remote and forbidding portions of this, at best, difficult terrain.

Almost in the center of the Mohave Desert region is a gentle depression some 23 miles long by 5 or 6 miles wide. This shallow basin now is utterly devoid of living things with the exception of a few gray and almost lifeless desert plants and an occasional lizard. But we are not to be fooled by surface circumstances. After all, the sandy swales and draws of Clovis, New Mexico, were in Folsom times lakes and running streams. Lake Mohave also was, in the lush

years of the Glacial Period, an expanse of blue water ringed around with the vegetation to which it gave life. These spectral desert wastes of the present day may well have been, ten thousand years ago, not only livable but very desirable spots.

On this theory, certain California scientists had skirted the ancient shores of Lake Mohave in search of evidences of former occupation. They were not disappointed, even in the hard and pebbly beaches that had not seen a wave for ten thousand years. Here and there along these old shore lines they found on the surface flint implements, man-made and evidently ancient. Also, sporadically, on the terraces which the Lake Mohave moisture had worn level, they picked up occasional bones of mammoth, horse, and camel. It certainly appeared as if California, too, was to be reckoned with in any full story of ancient man. That these early fellows had picked the middle of the Mohave Desert for their abode was not because of a lack of choice but because of a difference of several millennia of change.

All around the shore lines of the dry lake the camp sites were traced. Apparently the ancient Mohave men had lived there when the shallow desert basin contained some 40 feet of water. What a different place that desert must have been in those days. The moisture meant vegetation and the vegetation meant animal life. Any ancient men with fairly adaptable flint weapons could carve out an existence for themselves in the middle of an animal world. Man had shown that his superior reason could outwit even the

mightiest of mammals. It would seem that California could claim a group of Pilgrims ten millennia before Plymouth Rock.

The flint weapons, themselves recovered in the camp sites around the edges of Lake Mohave, added little to what we already know. In the repertoire of these desert dwellers were rough flint choppers, knives, and scrapers, all instruments with which they could flay and dress animal skins, work wood, and otherwise modify their surroundings for their own comfort. The projectile points were distinctive, but again, not at all Folsomlike. The points were rudely chipped from rough flinty material and were likewise adapted for tipping spear or lance shafts. These spear points, however, were notched much in the manner of a later Indian arrowhead and if found by themselves would be scarcely noticed in any curio store collection.

One of the many satisfactory aspects of the Folsom man was the fact that he manufactured a highly specialized type of flint point which can be recognized anywhere. The Lake Mohave men were not so thoughtful. The Mohave points, although a different type, may not always be recognized out of context. Also the Mohave men, whether because of poor material or less inclination, did not work their stone so skillfully. Although not so crude as the Abilene tips, the Mohave Lake points are not so finely manufactured as are Folsom or Yuma points.

Another disturbing feature, especially when compared with the Abilene situation, is that the Lake Mohave camp

sites are on the surface or only slightly buried. We have already seen that the closing phases of the Glacial Era, and especially the change into the lower moisture contents of modern times, tended to cause erosion and the burying of these ancient levels. The Lake Mohave evidences are scarcely buried at all. As in the "blow-out" sites where brass kettles and Indian arrowheads might lie side by side, it is difficult to date ancient men by material on the surface. Indeed, anything from a mammoth tusk to a catsup bottle, might be on the surface. For this reason, we are slightly uncertain whether to admit Mohave men to the Folsom family or not.

There is an additional disturbing feature about the Mohave men. Some of these careless fellows established a camp site on what was formerly a sandbar at the outlet to the ancient Lake Mohave. If these men had lived there during the wet period, which indicates ancient times, their dwelling place would have been a very damp place indeed. If they had lived there during modern times, it would have been a very dry place. This particular camp site is extremely disturbing and does not add to the reputation of the Mohave man.

Possibly, with California ingenuity and typical Hollywood fortitude, the desert dwellers of the dry lake beds of California will be admitted to the ancient family. Many scientists believe that these two were country cousins of Folsom men. They may have been hunters trained by Folsom forefathers who had found the hunting good and the

food plentiful in these at present inhospitable regions. It seems that the first men to see California found their way down the western coast and thence to the banks of the Mohave Lake. It is interesting to note that apparently the first Californians did not settle within the city limits of Los Angeles.

Not to be outdone by the other western states, Arizona also enters the field. Curiously enough it was not a group of Arizona scientists but a group of school children who brought about Arizona's prominence. These children, belonging to a small school near the town of Cochise in southern Arizona, were whiling away the recess period by playing in an arroyo or dry wash near the schoolhouse. As children and scientists do, they brought back with them on their return various odds and ends which seemed to them either interesting or pretty. Some of these they deposited on the front porch of the schoolhouse as they re-entered. The collection consisted of several bright pebbles, a couple of smooth stones a little larger than a cake of soap, a piece or two of chipped flint, and a handful of tabular fragments of a mammoth tusk.

Almost at the same time that the Folsom quarry was being examined in the north, these antiquarian curiosities from Cochise came to the attention of the University of Arizona. The pattern was much the same. A scientist came out to commend the schoolteacher for taking an interest in such things and to examine the arroyo in question. Usually such visits are sheer courtesy, but in this instance it was well

worth the professor's time to walk down that particular arroyo with those particular school children. The youthful discoverers pointed out with childish enthusiasm the place where they had collected the implements and the pieces of ivory. As at Abilene, the depth below the surface was somewhat indicative, although in this instance the implements were buried only about 13 feet in the dirt bank.

Ranging excitedly up and down the dry gulch, the professor pulled out pieces of charcoal and rough stone choppers and the flat stone pebbles that the school children had pointed out to him. Here and there were larger slabs that showed on their surfaces the effects of grinding as though one stone had been milled upon the other. In places the charcoal was thick and the pieces were large enough to identify. Whole ends of burned branches and areas where fires had been gave ample testimony that a level of occupation had been cut by the erosion of the arroyo. Again the edges of the age-old blanket that covered the ancient story had been accidentally torn by the chance course of the dry wash.

With characteristic procedure, all the evidences of the Cochise arroyo were examined and all branches of science were called on for help. Botanists identified the charcoal remnants from the early camp site as the wood of poplar and hickory. Geologists demonstrated that a layer of very hard stonelike ground, which lay above the charcoal and the implements in the bank, was a type of deposit that could only be formed in small lakes and ponds.

The magic of water always forms a fitting background for our stories of ancient man. Wherever we have found him we have come to expect the moist evidences of a former dripping era. Without it we would now feel completely lost. The fact that it was wet enough to support poplar and hickory trees during Cochise times does not surprise us. At the present time, a hickory tree could not possibly survive on the very attenuated moisture of southern Arizona, especially in the Cochise Valley. It is surprising to find deposits of mineral above the Cochise level in the side of the arroyo. This could only mean that the wet times lasted long after the period when Cochise men lived on the spot. It would seem, then, that we had in this obscure southern Arizona arroyo evidences of another early American. Who could this one be? The remnants that he left behind looked as old as Folsom.

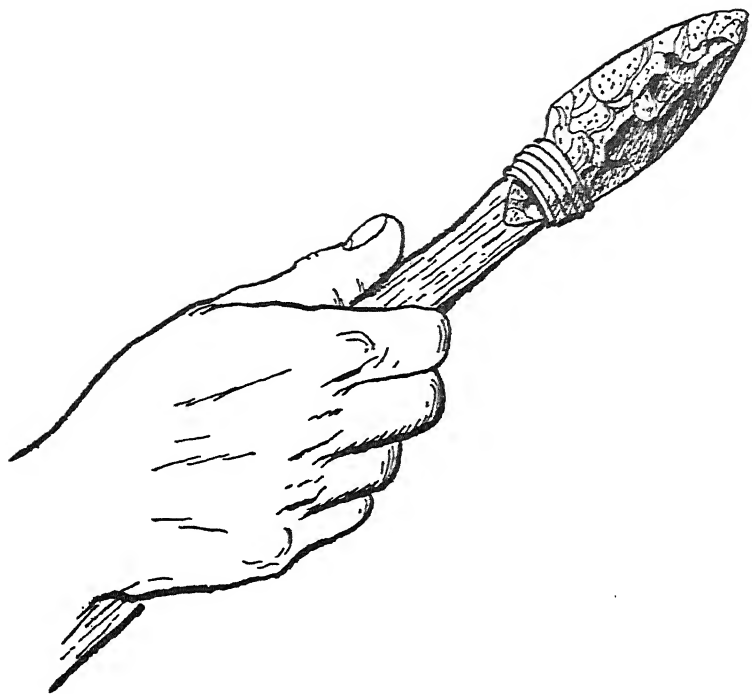
The examinations of the rest of the Cochise discovery, however, was disturbing and disappointing. Try as they might, neither the school children nor the scientists could find in the arroyo anything that even faintly resembled a projectile point. Spear points had come to be a prerequisite of the earliest men. The spear point in the case of Folsom and Yuma was their watchword or fingerprint "index fossil." They could not get along without it in their way of life, and we could not get along without it in identifying them. And yet in the Cochise find, even during subsequent examinations, no projectile point of any sort came to light. Either we would have to change our ideas or change our dating.

The many flat milling stones and rounded pebbles might be the clue. These stones could only have been used for grinding something. In modern times, of course, this something might have been cornmeal, or wheat, or flour. However, corn was not to be domesticated in these regions for many thousands of years after this time, and wheat was not introduced until the Europeans discovered the New World. Many early peoples used milling stones of this general sort for grinding wild seeds and nuts, which they often mixed with meat or made into a flour. The Cochise men must have done the same. Apparently they ate no meat, unless they utilized small rodents and other small forms of life that could be trapped without the use of any projectile or weapon. One student expressed it, as he removed another milling stone from the bank where he was working, "Why, these fellows must have lived on bird seed." The student was almost right. The Cochise people, from the implements and the debris which they have left behind them, show no evidence of any hunting propensities whatsoever. Difficult as it must have been to kill any of the mighty mammals with a puny Folsom point, it obviously was impossible to do so without any flint point at all. The only conclusion we can reach is that the Cochise men may have been America's first vegetarians.

We do not like to think of our earliest ancestors as being merely nut gatherers. The mighty Folsom hunters seem more attractive candidates for the position. Many other Cochise-like finds in other parts of the Southwest indicate that these "collecting Americans" were a whole series of

groups or tribes extending from late glacial times to the end of the glacial period. Some of the Cochise gathering people are definitely later on our chronological "hat rack." The Cochise seed gatherers would make much better degenerate descendants of Folsom man than his contemporaries.

In the hard times when the animals of the Glacial Age died away and the rains dried up and the grass withered, filling the larder must have been difficult indeed. Logically taken, these spare times following the good hunting of the Folsom Era would be a time when men, and women too, would scramble for seeds and berries and roots or anything else that might be determined edible. During the earlier times, when the herds of bison rumbled down from the north with the coming of fall and the four-horned antelope and the glacial horse fed in bunches on every grassy terrace and open slope, the times were hardly those when men would eat acorns or hickory nuts as a stable diet. The Cochise seed gatherers must, indeed, have been poor country cousins of the Folsom clan, and late cousins at that.



CHAPTER 9

Sandía Cave Man

THE HUMAN ANIMAL HAS from earliest times been a cave animal. This truth can be demonstrated in a dozen ways in Europe and Asia. Many of the earliest remains of our forefathers have been rooted from the rubble of cave floors. Some of the caverns of Europe were occupied for thousands of years. Generations

of human beings cowered in the gloom of these caves and looked out with apprehension into the brightness of an outside world teeming with fearsome animals. Any natural rocky crevice served as a shelter and a protection to our practically defenseless ancestors. Many a weak animal has eked out an existence amid savage and inimical surroundings by spending most of its time in a burrow or a hole.

We are surprised to discover, then, the remains of the early hunters of America in open camp sites. Lindenmeier and Clovis and even the original Folsom quarry were all places along stream banks and around the edges of marshes and ponds. The early American hunters apparently lived unafraid, even where the bison and the pounding herds of mammoth came to water.

This statement becomes even more inexplicable when we remember the bad weather that we have described for those remote times. The chilling winds that whistled down from the glacial ice walls must have made living cold and uncomfortable indeed on the open plains. Even in partially protected valleys the wet and the rain with the attendant cold would have made existence miserable. The Folsom men of course possessed the secret of fire, but even this would mitigate only in a small way the discomfiture of exposure to the elements.

The absence of any indication of habitation or shelters on the open hunting sites deepens the mystery. Even if the homes were lodges made out of brush and sticks of such an ephemeral nature that no trace exists, it still would seem an

uncomfortable way for a thin-skinned animal such as man to get along in a glacial climate.

Until 1936 it was common archaeological opinion that early man in the New World was such a hardy creature that he remained close to where the game animals were to be found in abundance, and that an open camp site in the wet grass along a stream was his natural habitat. Then, by accident, we came upon a New World cave man, a primitive hunter that satisfied all our expectations as to how ancient man should act and live. The most remarkable thing was that this primitive proved to be even older than Folsom man himself, whom we had originally thought was the earliest American.

This discovery involved a quiet Sunday afternoon and a student from the University of New Mexico. This particular young man, Kenneth Davis by name, was spending his week end in exploring caves in the vicinity of Albuquerque and collecting such bits of evidence in them as might be of interest to the museum at the University. On this particular occasion, he brought in, on a memorable Monday, a cigar box full of ancient baubles of no especial note. He had garnered from the floor of one of the caverns a few bits of pottery, a piece of deer antler cut with a knife, and some fragments of woven yucca sandals and basketry. This collection elicited no special interest in itself, as the remains were of the sort usually found in comparatively modern Indian encampments. Apparently some Pueblo Indians of the last few hundred years had used the cave as a stopping

place during hunting trips into the mountains. The pottery fragments were of the type familiar to the Pueblos in the Rio Grande Valley. However, the cave had been inhabited, and that in it itself was something. Armed with flashlights, candles, cameras, trowels, and notebooks, we set out to check further on this particular cavern.

The cave proved to be one of a group of five, located high in the limestone wall of Las Huertas Canyon in the Sandia Mountain Range just east of Albuquerque. Of the five holes in the limestone cliff in this place, only one is of any size or depth, and even this one cannot be described as pretentious. It was from this one, however, that the odds and ends of old civilization had come. We called the cave Sandia Cave, from the name of the mountains on whose edge it is located.

Sandia Cave may more properly be described as a tunnel leading back into the cliff some 200 yards. Throughout a considerable portion of its length, the debris and dust are piled almost to the roof. Locomotion past these strictured spots may be made only by slithering along on one's stomach. The cave is exceedingly dry and redolent with the characteristic smell of bat guano and pack rat remains. It did not look particularly promising, because of its long slender form and its lack of roominess.

As the scientific party had crawled and groveled almost to the end of the tunnellike passageway, a flight of bats was disturbed from a chimneylike aperture that led upward from one of the galleries. With characteristic squeaks and the rustle of leathery wings, the bats rushed down the nar-

row passageway for the cave mouth. As they passed, the party involuntarily flinched close to the rocky walls to give them ample room. As they did so, one of the group felt beneath his hand, on a pile of debris, a curved bone. Even in the dark it felt unusual and important.

With some excitement we made our way to the cave mouth, and there, in the light of a New Mexico afternoon, examined our find. It was indeed a bone, but certainly no ordinary one. It was shaped like the curved flat blade of a Turkish dagger. It was a core from the claw of a giant ground sloth—that lumbering animal so typical of late glacial times. It could be nothing else.

This was a find indeed. If ground sloth remains were in the cave, and also human remains, we might find some evidence that men lived there at the same time as the sloths. We might yet find an American cave man. We did.

Even in our preliminary digging near the mouth of the cave we began to find evidences of human occupation. Men and women too had lived in the cave long before Pueblo times. We had stumbled by chance upon a cave that had been long inhabited by humans and in which they had left their remains in the same manner as had their European forebears.

We early found that the mouth of Sandia Cave, as it exists today, was in reality far back from the original entrance to the cavern. During the many thousands of years since the early men had lived there, the face of the cliff had sloughed away many feet, taking with it the original mouth of the

cave. At the present day, the Sandia Cave mouth is small and unimposing and rests on a cliff face approached only by a narrow ledge. The evidences that we were finding in the cave apparently had slid down into the tunnelliike passage that led off the back of the original occupation cavern. There was left, after all these thousands of years, only the rearmost portion of what had been the ancient Sandia Cave, but even this fragment was not disappointing.

We built ladders up to the entrance to facilitate excavating work, and a safety scaffolding around the mouth to keep enthusiastic students from falling off the cliff. During the last of the four seasons of work on the Sandia Cave, it became necessary to install a special suction apparatus to clear the fine penetrating dust from the cave as the work progressed. Even with the workmen wearing dust masks, this dust—dried and undisturbed for many centuries in the cave—was so fine and permeating that it rose in clouds at the slightest movement of a shovel or trowel. Penetrating into the lungs, the dust produced nausea and a type of dust pneumonia for the unfortunate excavators. But the results were worth even this hazard of cave excavation.

On almost the first day of digging, we discovered that the cave debris was not a simple pile of stuff that had gradually accumulated in the limestone passageway. The rubble and detritus that filled up the cave were made up of several different layers of material. These layers, as we came to know them after several months of excavation, proved to be extremely significant. Actually this stratification gave us as

much information as to the early history of the place as the artifacts and implements themselves.

Throughout the cave, and especially thick near the mouth, was a layer of modern accumulation. By *modern*, in this instance, we mean the last several centuries or possibly the last few thousands of years. This modern stuff consisted of dust, blown in by winds of many unrecorded storms, as well as the pack rat and bat accumulation deposited over this same time. Here and there fragments of limestone, fallen from the roof, were mixed with the dust, as records of earth tremors of many years ago. Near the entrance of the cave were a few fragments of Pueblo pottery and an abandoned metate or corn-grinding stone, showing that the Pueblo Indians of the fourteenth and fifteenth centuries A.D. had occasionally crawled into the cave for a night's shelter. Man's natural penchant for cave shelter has not changed in many thousands of years. Some scientists believe that agoraphobia stems from this human desire to feel protected by walls of rock with an opening only on one side.

In places in the Sandia Cave, this modern dust accumulation was 6 feet thick. Toward the rear of the open cave passageway, the dust feathered to only a light coating some inches thick. Throughout the length of the cave, however, the dust could be identified as an accumulation that had occurred since glacial times.

Beneath the dust accumulation of more recent origin, we came upon a hard crust of cave stone. This layer of material was the same as that which forms the stalactites and the

stalagmites of the usual limestone grotto. Stalagmitic formations were quite rare in the Sandia Cave. However, typical cave-drip formations had formed on the walls in many places where sheets of stalagmitic stone could be seen. This same material had formed a solid crust over the floor of the cave, as thick and hard as a cement floor. After clearing the dust debris from the topmost layer, it was necessary for us to break through this crust with sledge hammers. We did not mind this arduous labor, however, because the crust served effectively to seal in any more ancient material found below it. It was like opening the lid of a gigantic sardine can, whose contents would give you all the evidence you wanted for the earliest history of the New World.

This travertine crust was only 3 to 6 inches thick in most places and contained no implements or evidences that humans had been there while it was forming. It was, however, one of the most important features of the cave.

We did not need the clouds of penetrating dust to remind us that the Sandia Cave is dry at the present day and had been so for the many centuries that the dust was accumulating. This stalagmitic crust beneath the dust, however, could have been laid down only during a wet period. Such cave formations are formed by percolating waters seeping down through limestone crevices and depositing limestone secretion which the water carries in solution. This liquid limestone may be deposited in the form of iciclelike stalactites and stalagmites, or it may form in sheets of stony material over the cave floor. It formed in this latter way in

the Sandia Cave, as the limestone-permeated waters dripped and oozed out over the cave floor and evaporated there. The crust in the Sandia Cave, then, was laid down during wet and dripping times. What could these be but the lush times of the glacial period? Professor Kirk Bryan of Harvard University confirmed this point for us. The crust on the top of our "sardine can" marked the last wet period of the glacial era. What would we find beneath it?

Arduously chipping down with sledge hammers and crowbars into the concretelike mass below the crust, we came upon an ancient cave floor. This habitation level was marked by an accumulation such as the dirty human animal invariably leaves behind wherever he lives. There were fragments of bone, purposely split to extract the marrow, and the teeth of many kinds of animals. Scraps of flint and bits of charcoal were scattered throughout the mass. Stone fragments and dirt, brought in by countless comings and goings of prehistoric men, added to the mass of the layer, for the debris on this ancient cave floor was not solely the accumulation of wild animals. The shattered bones of the horse, the bison, and the camel had not been left there by their original unfortunate owners. No mammoth had brought fragments of his teeth and tusks into the cave. These remains had been left there by men—hunters who had brought the bones and bits into their cave home to gnaw the meat from their surfaces. Bits of charcoal told a story of cave cooking fires, built so long ago to cook the steaks and chops of these Ice Age animals. The very broken and

mixed-up nature of the debris told a story of human movement back and forth through the cave with countless nights of lairing there, with many trips to the valley below to bring back other chunks of meat containing more bones to add to the pile. It was the accumulation of centuries.

If we had needed additional evidence that men—American cave men—had actually lived in the place at this time, there were the flint points. Mingled amidst the bones and rock fragments, scattered just as they had been lost many thousands of years ago, we found several flint spear points on the old cave floor. The percolating lime-permeated water, seeping down through this ancient material during the wet period when the crust was forming, had cemented all the debris into a mass much like friable concrete. The flint points that we found were often glued fast to a rock or bone by the limy water which had seeped down over them for so long. It was extremely difficult to extricate the flint specimens without breaking them, and it was necessary to screen all of the material carefully after it was broken up so that no bit of lime-coated evidence might escape us in the gloom and flickering shadows of the excavating lamps.

As we carefully chipped, with a small dental tool, around the first of the flint points that we encountered, we saw the story clearly. There was the characteristic indented base and the beginning of the channeled grooves up either face of the point—it was a Folsom point. So Folsom man had laired in this cave, had dragged these animal bones into his home, had thrown them back over his shoulder into the darkness.

We found more and more Folsom points, most of them typical and exactly like those from the classic Folsom quarry where Folsom man had first been discovered. We found other points that differed slightly, yet maintained the main Folsom characteristics. There was no doubt that at least some Folsom men had lived as cave men in the Sandia Cave.

In addition to the Folsom spear points, there were flake knives of flint and flat chipped flint blades, probably used for skinning the animals that these hunters killed. There was even one point made out of a fragment of ivory from a mammoth tusk. We found, too, the small fine-pointed gravers which the Folsom people probably used for tatooing themselves. It was a typical Folsom assemblage. There could be no doubt that the same people who hunted Taylor's bison on the edge of the Great Plains had also used the Sandia Mountain fringe as a hunting ground and had stayed in the Sandia Cave during their trips.

If the discovery of a Folsom floor in the Sandia site were its only claim to glory, the cave would not be especially remarkable. As a matter of fact, we would have expected to find Folsom people using caves when they could. However, in the Sandia Cave we dug farther, down below the level of Folsom man, and we found what we had hardly dared to hope for.

Below the half-cemented bones, flint, and debris of the Folsom floor, we dug through a considerable layer of fine yellow ochre. This stuff lay in thin laminated strata, obviously laid down by water at another time when the cave

was wet. Although originally deposited in a moist period, the yellow ochre was as dry at the present day as everything else in the cave and rose in penetrating yellow clouds at the slightest disturbance. This noxious stuff gave color to the cave in more ways than one, so much so that we contemplated at one time calling the Sandia Cave, Yellow Ochre Cave.

But the yellow ochre level was not the lowermost level of the cave. Digging still farther down through this soft pigment, we encountered another ancient cave floor with evidences of man. Below the yellow ochre were other fragments of animal bones and flint and evidences of fire. It was another whole level of occupation and it occurred well below the Folsom cave floor.

At first we could see no difference between this lower debris, and the Folsom occupation level. There were bone fragments and teeth of the horse, camel, bison, mammoth, and mastodon. There were also the usual carnivores, the large wolves and cats of Ice Age times. As far as the animals were concerned, the Sandia Cave level, as we came to call this particular one, seemed no different from the Folsom.

As before, the flint points gave us our greatest information. We had come to look upon these flint spearheads that the ancient hunters had made as being extremely indicative of their times. A Folsom man chipped his intricate flint points with exactly the same technique and the same result as had his grandfathers before him. Changes in these weapons were extremely slow.

The flint points that we carefully lifted with the trowel from among the debris of the Sandia Cave floor were totally different from the Folsom. The Sandia points, for so we immediately called them, were rather crudely made. They were roughly chipped in a leaf shape with a notch or shoulder at one side of the rounded base. Though rougher and less skillfully made than the Folsom points, they were nonetheless distinctive, and we recognized at a glance that we were dealing with a different kind of man. These were Sandia Cave men, and they had lived as many thousands of years before Folsom times as it had taken to deposit the yellow ochre that separated their two levels of occupation in the Sandia Cave.

The accumulation and trash of the Sandia Cave level was not cemented like that of the layers above. In this level we traced out fireplaces with small rounded boulders outlining them. There were lenses of charcoal, still intact, where ancient cooking fires had been, and around their blackened borders were the split bones and fragments that showed where men had sat around these same fires and had gnawed the greasy flesh from these same bones and thrown them to one side. We could almost see, in the flickering excavation lights, the Sandia Cave men of so long ago, squatting around these now-dead embers.

The flint flake knives, the chipped skin scrapers, and the chips and debris of flint workings were mixed among the animal bones in much the same way as on any other cave floor that had been occupied by hunters. Indeed, the Sandia

Cave life must have been similar to that of the Folsom. Sandia and Folsom men were both hunters and they had both hunted much the same animals. The weapons that they used were undoubtedly similar, even though the flint points that tipped them differed greatly. The important difference was that the Sandia Cave men had slept in this cave and had hunted in these valleys long before the Folsom men. We had thought the Folsom men to be the first, but now we realized that the Sandia men were obviously the earlier.

The first question asked by any visitor who was enthusiastic enough to crawl into the cave with us was: "But how long before Folsom men did the Sandia men live here?"

Again Professor Bryan helped us. He pointed out that the various levels in the cave represented a succession of wet and dry periods. The dust of the topmost level represented the dryness of recent centuries. The crust that sealed in the ancient occupation was laid down when the cave was wet and dripping. The Folsom debris was accumulated when the cave was comparatively dry or Folsom men could not have used it. The yellow ochre had been deposited below the Folsom floor during a period of wet when the cave actually contained puddles of accumulated water. The Sandia occupation below the others, when the Sandia hunters slept and built fires in the cave, was also a period of dryness. Below the Sandia Cave floor was a layer of white clay and an ancient water channel which indicated again the presence

of water in the cave long before even Sandia man had used it.

At first thought, the wet and dry periods of the Sandia Cave might appear to correspond with the four great glacial eras as they have been defined by geologists. Because of a number of difficulties, however, such an explanation did not fit. The time span of both Folsom and Sandia man was not enough, even if we applied our wildest chronology to them. Professor Byran, logically building up his evidence piece by piece, showed us that the Sandia Cave wet and dry levels must correspond with fluctuations of the last ice sheet that swept down from the Rocky Mountain area. The tongues and protrusions of this tremendous ice mass had advanced and retreated in an oscillating fashion, consuming several thousands of years with each of their minor advances and retreats. This complexity in the glacial age had been demonstrated from geological evidence, especially in the region of Colorado where these various tongues of ice had left piles of gravel and glacial detritus at their farthest point of advance.

Fitting in the Sandia Cave levels to this glacial chronology of advances and retreats, Sandia Cave men were dated at around twenty-five thousand years B.C. Since a few thousand years makes little difference geologically, Professor Bryan calculated an error of as much as 30 per cent in this estimate. When we finally dated the Sandia man by radioactive means, we were astonished to find how accurate this

glacial time table was. We are satisfied now that the Sandia people existed on the North American continent well before the Folsom hunters. It seems extremely unlikely that any hunters earlier than the Sandia men existed on these continents or the many excavations would have given some hint of their presence. The Sandia people, then, were almost certainly the first Americans.



CHAPTER 10

The World of the Ancient Hunters

GEOLOGISTS ARE RECKLESS people. Whereas the archaeologist carefully counts the passing centuries, the geologist handles millennia with complete abandon. The changes that affect the face of the earth are so slow that they seem timeless according to human standards. To man, the hills are eternal; geologically, hills are nothing of the sort, but are characterized as masses of earth and rock in a constant state of flux and change.

Between these two points of view, the one dealing in millions of years and the other in paltry centuries, the story of man must be outlined. The entire development of our fascinating ancestors took place against a background of geological change. The scenes, the backdrops, the stage,

and the other characters of the drama of life were all geologic phenomena.

Geology is the story of our world. Its course is presumed to have lasted one billion years or thereabouts. Radioactive tests on some of the oldest rocks in the world indicate antiquities of one billion, eight hundred million years.

The whole development of man occupies only about one million years, or the last fraction of geologic time. The earliest Americans, early as they were, crossed the Bering Strait and wandered up the valley of the Yukon only about thirty thousand years ago. This, in geological chronology, was only a few minutes ago. Is it strange, then, that we call these continents a "New World"?

But this hemisphere was new in more ways than one. The Folsom and Sandia men were rank upstarts in these wildernesses. Also comparative newcomers were the animals among which these early hunters lived. New, too, were the great glaciers which poured their millions of tons of ice out over the landscape. This age of new animals and ice was called the "Pleistocene" or the "Great Ice Age." These are the times when our European ancestors lived. This was the world of the ancient hunters.

Pleistocene is a scientific term derived from some Greek words which mean "most of the new." The "new" in this particular case refers to new animals—lots of them. This time which, as we have just seen, represents only the last small fragment of the long span of geological chronology, was characterized chiefly by the appearance of large num-

bers of new animals. The appearance of these many new species and many millions of each species prompted the geologists to name this period the "Age of New Animals." These new varieties of living things so profoundly affected the ancient hunters that it is impossible to consider these early times without a knowledge of the animal background.

Geologically speaking, these animals also are Johnny-Come-Latelys. Millions of years before the Pleistocene period animals had appeared in all parts of the world and had developed, matured, and become extinct. Many geological ages prior to the appearance of man, animals were a part of the teeming life on the face of this fascinating planet. This is only to say that man, as one of the animals, was a very late comer indeed. The geologists, with their handling of immense amounts of immeasurable time, tend to give us an inferiority complex as to our antiquity. Nevertheless, a thousand years, according to human standards, is still a very long time.

Man, then, and the Pleistocene animals with him, are many millions of years later in the scale of development than were any of the dinosaurs which form some of the central exhibits in our museums. No human being existed in the New World or in any part of the Old World at the same time that the mighty Brontosaurus or the Tyrannosaurus rex were chewing each other to ribbons in the primordial marshes. Stories and moving pictures that depict early men battling dinosaurs are fictional in the extreme. A knight in full armor in the United States Senate would be

no more incongruous than a Sandia man battling a dinosaur. No human eye ever saw a true dinosaur alive. The age of the "Terrible Lizards" occurred millions upon millions of years before the period of man. Only a few of the smaller representatives of this ancient age of reptiles have managed to survive until the present day. Following the many forms of dinosaurs, various varieties of animals became the dominant life forms in all parts of the world. Man, himself, was one of the latest of the animals to develop. Man's background was concerned entirely with animals—and new animals at that.

In the closing fitful moments of geological time, then, a number of new kinds of animals appeared on the continents of this world. North and South America were the origin places of large numbers of these. Indeed, the numbers of animals, especially of large sizes, which made their appearance during these times, were so noteworthy that they provide the main characteristic of the period. Our earliest ancestors lived in a veritable zoo. There never was before, nor has there been since, any time in the history of the world when the plains and mountains were peopled with such a varied and plentiful fauna.

The other name for this interesting period is the "Ice Age." We have already seen that these tremendous masses of frozen moisture profoundly affected the history of the earliest Americans. The glacial advances likewise affected the existence and habits of the many animals of this Pleistocene world. Man, the Pleistocene animals, and the great

glaciers formed the outstanding phenomena of the most interesting era that the world has ever seen. The three are inextricably mingled in their histories and their fortunes.

The million years of the Pleistocene period were punctuated by glacial advances that displayed a certain rhythm. It was discovered very early in Europe that the great ice masses that moved out over the European area were four in number, in a quadripartite pattern. During Pleistocene times, at four separate periods within this one-million-year span, the ice masses formed, spread out slowly over the surrounding country, and then, inevitably, melted and shrank back again. These four ice advances divide themselves nicely into two pairs. There was an earlier couple of glaciations and a later couple, with a very considerable gap of a few thousand years between.

When geologists and archaeologists began to study the glaciations that had taken place in North America they discovered to their glee that the North American ice advances were quadruple also. In the same manner, the New World glaciers had swept down over the landscape in two pairs. The interglacial period that separated the second from the third of these ice advances was by far the longest in duration of the whole sequence. Further investigations in Africa, Asia, and South America convinced all concerned that whatever it was that caused the ice to form and pile up and spread had affected almost the entire world.

The fact that the Glacial Age was divided into four periods is of tremendous importance. We can, by this means,

utilize four chronological shelves into which we may place our history of that interesting animal, man. Throughout the fluctuations, the advances and retreats of these mighty walls of ice, the history of man is woven. The Age of Ice encompasses practically the entire story of the development of man. His stage always had a wall of ice not far behind it.

Speculations as to what caused the glacial era have been rife for the past hundred years. Even today scientists have not arrived at an absolutely satisfactory explanation as to how this era occurred. Some have suggested that the world had passed through the tail of a comet during those four periods and had been consequently affected by the shadow of the many particles of matter cast into the atmosphere. Other scientists explained the gathering of the ice caps as due to chemical energies not yet well understood. Fluctuations in the irradiation of radioactive substances were proffered in explanation for cycles of heat and cold. Universally it was accepted that the Pleistocene Age had been marked by four cold periods which had caused the formation of the ice. The periods of the piling up of ice and snow were interspersed with warm periods which caused the ice to melt and retreat. These periods were a paltry million years and each of these advances and retreats took many thousands of years to accomplish.

Only recently archaeologists and geologists, working together, have determined that the formation of large masses of ice is not dependent upon cold alone. As a matter of fact, the largest accumulations of ice that we can observe at the

present day are accomplished by tremendous snowfalls rather than by extremely low temperatures. Snow, falling year after year on mountain heights, which is not entirely melted during the summer months, is eventually built up into ice fields of tremendous thickness. If these ice fields become extensive enough and thick enough, the ice, by its very nature, begins to move slowly out over the face of the land. Moisture even in a rigid, frozen state is not entirely immobile. With extremely slow fluidity the ice moves over the surface. At the same time, it exerts tremendous force and gouges up, as it moves forward, dirt, rocks, and trees and anything else that stands in its way. The ice walls of the glacial age, then, pushed before them, like gigantic cosmic bulldozers, unbelievable amounts of gravel and detritus.

When the ice wall had crawled in its inevitable snaillike manner across the face of the landscape for a few thousand years, the process was reversed and the ice stopped and then began to melt back in retreat. These dead glaciers, wasting slowly away, dumped all the accumulation of debris that they had gouged from the surface of the territory over which they had passed. Very often this debris is of such bulk that it forms a line of hills which thus mark the farthest extent of the icy advance. It is by means of this material, dumped when the glacial walls retreated, that we can trace the fluctuations of the vacillating Age of Ice.

All of this would be of purely academic interest were it not for the fact that man's history is found in, around, and under these piles of glacial scraps. If we find human material

beneath the gravel pushed up by a glacier, we deduce that that particular man lived there before the wall of ice came that way. If we find his camp site on top of the glacial moraine, we are certain that he lived there after that particular glacial advance. Thus the archaeologist can use these geological time periods as a chronological "hat rack." The glacial advances are crude and clumsy, as they deal in many thousands of years; but in broad terms, they give us our best outline of human events.

The interglacial periods were not particularly tropical and the icy periods themselves were not so frigid as one might expect. Generally speaking, it was not so much the ice that affected the life of early man as it was the rain and snow and fog that the ice produced.

When the glacial walls of ice reached out over the land, the mountainous centers, such as the Rocky Mountain area or the interior of Canada, were piled thousands of feet thick with the ice and snow. During these times the weather was terrible. Even hundreds of miles from the ice cliffs there was rain and wet snow in abundance. These periods were known as the Pluvial times, when the rainfall increased and lasted over a longer period of the year. This, of course, coincides with what we already know of the history of early man. The Folsom hunters lived around lakes that are now dried up. The Sandia cavemen lived before and after periods when the cave was a wet and dripping place. Even though other glacial happenings do not come close to the

sites of our ancestors, we can be sure that the glaciers were not too far away by the evidences of wetness that we find. Each of the four great glacial advances produced a wet and rainy period over the whole continent, and especially in the immediate vicinity of the ice walls.

Unfortunately, too, the quadripartite division of the Age of Ice is not quite so simple as it would at first appear. The four divisions of this era have been named in North America according to various states in which the accumulations of rocks and gravel of each advance have been found. Thus, piles of glacial debris from the first glaciation have been found in Nebraska, and so the first division of the Ice Age is known as the "Nebraskan." The other three glaciations, respectively, and for the same reasons, are called the "Kansan," "Illinoisan," and "Wisconsin." As these four icy fluctuations occurred over a million years, our earliest Americans really concerned themselves with only the last of the four, or the "Wisconsin." The earliest Americans lived during and after the Wisconsin glacial advance on this continent.

It may not surprise us to discover, then, that the Wisconsin glaciation was not a single, simple, well-regulated chunk of ice which gathered and swept out over the country and then retreated in a legitimate manner. During the fifty thousand years or so of Wisconsin's icy times this unpredictable glaciation thrust out tongues and lobes and extrusions of ice in many unpredictable directions. Some of these pro-

trusions were retreating while others were advancing. It was in, between, and around these lobes of ice that the earliest Americans hunted and lived and died.

When the very first American set the very first foot on the muddy soil of what is now Alaska, he undoubtedly saw in the distance some of the glacial masses of Wisconsin ice. During the period of his development in Saskatchewan, Colorado, and New Mexico, he saw and felt on many occasions, and over several thousands of years, the comings and goings of the Wisconsin ice cliffs. The cold winds that swept down off the frozen masses chilled our early hunters to the bone. The rain and the drip and the wet that these winds brought with them grew the grasses and the bushes and filled the ponds and lakes that made the North American continent a game paradise. The ice was the scenery; the animals were the actors.

The Pleistocene period opened in the New World with an abundance of animal forms. We must remember at the onset that these were not affected adversely by the advances of the ice tongues. Apparently these animals lived around the glacial walls, retreating slowly before their advances and following their retreats. The ice was definitely not a detriment to animal life. If anything, the ice masses, by their influence in producing abundant rains, made possible the teeming fauna of the Glacial Age.

At the onset, many large forms stalked the plains of the New World. The great ground sloth was there, the mastodon, the horse, the tapir, the camel, and the wolf. Giant

beaver built great dams across long-forgotten rivers. These animals were all on this continent long before man himself appeared. Their evolution goes back into geological time many thousands of years and can be traced with fair certainty.

In Asia too, at this time, there were many varieties of large animals. On the reaches of Siberia and China, other forms of elephants and oxen and bison and deer had developed. Somewhere in the middle of Pleistocene times these Asiatic forms tramped across the narrow land bridge of the Bering Strait area and entered Alaska. There probably was no exceptional reason for this movement, other than the occasional browsing of some curious mammoth as he went from tree to tree hunting ever greener leaves and twigs. The Asiatic animals simply fed across into Alaska and down into the interior of North America when the walls of glacial ice did not prevent their advance. In this way, one of the most picturesque animals of Pleistocene times immigrated to the New World. This was the woolly mammoth, which was to play such a large part in the story of the early Americans a few thousand years later. In the middle of the Pleistocene period the woolly mammoth became as native as any of the original animals, and trumpeting herds of these reddish-brown, hairy beasts moved from Alaska in the north to Central and South America in the south.

The original American resident, the mastodon, and the later Asiatic newcomer, the mammoth, were both true elephants. Although differing in detail, in general aspects,

and in size and body build, they looked much like the peanut-eating variety of Indian elephant that characterizes our circuses today. On the camp sites of early men, the remains of these two elephants are easily distinguishable. The teeth of the two animals differ greatly. The mammoth had a large relatively smooth molar the size of a small loaf of bread. The mastodon, on the other hand, chewed his herbage with tremendous molars fitted with ridges and cusps like a miniature mountain range. The mammoth was characterized by long, extremely curved tusks, so ungainly as to be almost unusable. The mastodon carried relatively straight tusks of more modest dimensions. There were several varieties and variations of both the mammoth and the mastodon. However, at least in late Pleistocene times, the mammoth seemed to overawe his cousin the mastodon as far as numbers were concerned. Associated with the remains of early man, mammoth bones were quite common and mastodon remains extremely rare.

At the same time there moved across from Asia giant bison—varieties with both straight and curved horns. The musk-ox came also, and the giant elk, similar to our present-day moose. It is interesting to note that almost all of these animals were larger than present-day varieties. In those mid-glacial times, the animals seemed to grow bigger and better than the members of the same varieties that we see in the present zoological parks.

The bears moved into North America more slowly and spread gradually during the Pleistocene period to the South

American continent. Mountain sheep and mountain goats moved across also during those times. It is not strange, then, that man, a few thousand years later, found his way along the same route.

These fascinating animals populated the surface of the Pleistocene world, cropping the abundant herbage that the Ice Age moisture made possible. Had you tramped the Yukon Valley or the Mississippi terraces during those times, you would have seen on every hand herds of mammoth, horse, camel, and bison of many varieties. Half a dozen forms of mammoths flourished during the period and as many species of bison.

Threading throughout this animal assemblage were the carnivores. There was the great saber-toothed tiger, whose canine teeth were so long that they reached almost down to his chest. There was the dire-wolf, a great skulking fellow that by comparison would put the modern timber wolf to shame. The cave bear of Pleistocene times was at least as large as a modern Kodiak.

It has occurred to many that Africa, with its attractive array of elephants, antelopes, and carnivorous cats, now represents an assemblage very similar to that typical of the Pleistocene. The African animals are truly Pleistocene animals that have somehow survived until the present day. One might say that our landscape has lost a great deal in the last ten thousand years. Big-game hunting in Canada would be far more fascinating today if the woolly mammoth were the quarry.

The early American hunters are associated with only a few of these animals. We have already seen that Folsom man delighted in killing Taylor's bison, one of the varieties that characterized the latter portions of the Pleistocene period. Folsom men also brought down with their lances the fleet, pot-bellied horse of these times as well as the small llamalike camel. Ever since the first discovery of these early men, we have been intrigued with speculations as to how they dealt with the woolly mammoth. That they did kill these elephants is amply attested by the mammoth bones found at the Clovis camp site and other sites that we have explored. The Sandia cavemen also killed and ate these ponderous beasts.

We are surprised, perhaps, to find the horse prominent among the animals of this period. Actually, the horse is peculiarly American, as its development can be traced in great detail from remains discovered in various parts of North America. Long before the Pleistocene period, varieties of horses galloped and grazed over the hills and valleys of this continent. When the first Sandia men threaded their way through the herds of game animals down into what is now known as New Mexico, they undoubtedly saw horse herds on every side. They never rode these horses, but they killed and ate them when opportunity offered. The horse, however, never seems to have been a favorite game animal with Folsom man. The Folsom men apparently preferred the slower-gaited and heavier Taylor's bison as their favorite food animal.

At the end of the Pleistocene period, the American horse became completely extinct. Horses of several sorts had already crossed the Bering Isthmus land bridge to populate Asia, Africa, and Europe with different kinds of equines. In postglacial times Asiatic horses were domesticated and introduced into Europe and ultimately into Spain. The final domesticated and considerably changed variety of the horse was brought into Mexico by the Spaniards in their early exploratory days. Various horses escaped from these early expeditions or were stolen by the Indians. The reintroduced horse flourished in a few short years from scattered individuals to herds of thousands. It seemed as though the Great Plains area was ideal horse territory, and the horses of Spanish descent felt as much at home as had their ancient Pleistocene ancestors.

It is interesting to speculate on what a journey must have been like in this era when man in a loincloth threaded his way across a level valley floor dotted with feeding herds of mammoth and gigantic bison. Among the bushes by the river courses skulked the great cats, as anxious to make their next meal on a tender human as upon a toothsome horse. The highbrowed, narrow-headed mammoth looks short-tempered even in the skeleton. Man would be a poor match, indeed, for even one of these animals in open country. There could have been few dull moments in Pleistocene times.

With camels and elephants galloping over the primeval meadows of the New World, the natural inclination is to

spot a few palm trees in the background. A popular conception is to cite a tropical period for Alaskan regions during these times. Elephants and the tropics seem to go hand in hand. Actually, Folsom and Sandia times were far from torrid. During most of the period the general temperature probably could be described as temperate to cold. Alaska during Pleistocene times undoubtedly was cooler than temperate, at least for a considerable number of months of the year. We have, fortunately, a fairly certain idea of what the bushes and trees were like, for of course these faithfully reflect the temperature and the general climate.

In the Alaskan mucks, on several occasions, stomachs of frozen mammoth have come to light. These stomachs have been preserved by the same flux of freezing and eternal refrigeration that has saved skin, tendons, and even flesh, here and there, in these fascinating deposits. These stomach masses, eternally frozen, since the original unfortunate animal ate his last meal and passed away in those regions, yet contain leaves and grass that the animal consumed. These remains, even though partly digested so many thousands of years ago, show the kinds of bushes and trees that the mammoth ate in his prime. Surprisingly enough, the remains show the leaves of alder, birch, and willow, exactly the same trees that grow in Alaska today. The climate, then, certainly differed little, if any, from the climate of the present time.

Most of these interesting Pleistocene animals were ac-

customed to cold. The woolly mammoth, as his name implies, was well fitted to resist the cold of Pleistocene winters. In spite of being a real elephant, he was not at all tropical. The bison and the horse, too, were well adapted to cool or temperate surroundings. Actually our only worry in this regard is for man himself. If anyone was chilly in Pleistocene times, it was ancient man, the most hairless animal of the whole Pleistocene assemblage.

How did Folsom man resist the chilly winds and fogs and mists that swept down from the glacial walls to the north? Even Sandia men, crouching in their caves around the fires, must have had a chilly time indeed. With the high humidity and abundant rainfall, the cold was all the more marked. The time of the earliest Americans was not at all comfortable.

When the first of the ancient immigrants arrived in the New World they found themselves one animal among many already there. It was a New World of teeming animal life. It is not at all strange that these men lived by hunting, and ever in the background, amid these fascinating surroundings, were the glacial masses of ice that at the same time limited and supported the huge animal populations. It has been estimated that the Pleistocene Age featured forty million large animals in North America alone.



CHAPTER II

End of a Universe

THE PLEISTOCENE PERIOD ended in death. This was no ordinary extinction of a vague geological period which fizzled to an uncertain end. This death was catastrophic and all inclusive. The ice, which had provided the frigid backdrop for these primitive scenes, shriveled away in melting rivulets. The large animals that had given the name to the period became extinct. Their death marked the end of the era.

But how did they die? What caused the extinction of forty million animals? This mystery forms one of the oldest detective stories in the world. A good detective story involves humans and death. Those conditions are met at the end of the Pleistocene. In this particular case, the death

was of such colossal proportions as to be staggering to contemplate. The antiquity adds a rare relish to the tale. Who or what killed the Pleistocene animals is a query that has not yet been answered. The Sandia and Folsom men apparently survived the catastrophe that overwhelmed the animals of their period. But what role did the ancient hunters play in this drama?

The "corpus delicti" of the deceased in this mystery may be found almost anywhere. Although we have followed the fortunes of our American ancestors for the most part in the western states, where we first found their Folsom and Sandia points, the animals of the period wandered into every corner of the New World not actually covered by the ice sheets. Their bones lie bleaching in the sands of Florida and in the gravels of New Jersey. They weather out of the dry terraces of Texas and protrude from the sticky ooze of the tar pits of Wilshire Boulevard in Los Angeles. Thousands of these remains have been encountered in Mexico and even in South America. The bodies lie as articulated skeletons revealed by dust storms, or as isolated bones and fragments in ditches or canals. The bodies of the victims are everywhere in evidence.

It might at first appear that many of these great animals died natural deaths; that is, that the remains that we find in the Pleistocene strata over the continent represent the normal death that ends the ordinary life cycle. However, where we can study these animals in some detail, such as in the great bone deposits of Nebraska, we find literally

thousands of these remains together. The young lie with the old, foal with dam and calf with cow. Whole herds of animals were apparently killed together, overcome by some common power.

We have already seen that the muck pits of Alaska are filled with evidences of universal death. Mingled in these frozen masses are the remains of many thousands of animals killed in their prime. The best evidence that we could have that this Pleistocene death was not simply a case of the bison and the mammoth dying after their normal span of years is found in the Alaskan muck. In this dark gray frozen stuff is preserved, quite commonly, fragments of ligaments, skin, hair, and even flesh. We have gained from the muck pits of the Yukon Valley a picture of quick extinction. The evidences of violence there are as obvious as in the horror camps of Germany. Such piles of bodies of animals or men simply do not occur by any ordinary natural means.

Neither the Pleistocene animals nor their untimely end are phenomena peculiar to the American continents. Asia was deeply involved in the animal story of the earliest Americans. Many of the animals that we now think of as being typical of the early hunters of the New World trumpeted their way across the Bering Strait from Asia. Europe, too, was a true Pleistocene picture during those same times and offered a panoply of large animal forms as fascinating as those that Folsom or Sandia man knew and killed. Many thousands of years before the story of the earliest Americans ever began, other earlier humans were

hacking with their puny fist axes on the tough hides of elephants and bison in the valleys of France and Germany. The European Pleistocene featured the rhinoceros, and the giant Irish elk, and several other forms of which North America could not boast. These millennia were characterized all over the world by typical large animal forms.

As the icy glaciations of Europe, Asia, and America were apparently synchronous, and the animal populations also were similar, it is not strange to discover that the end as well was universal. The mammoth herds of Siberia became extinct at about the same time as the European rhinoceros. The cave bear of Europe and the bison of Siberia met a common end. The American camels met their death apparently at about the same time as the Asiatic elephants. Any argument as to the cause of so much death must apply not only in North America but in Siberia and Europe as well.

This catastrophe, fortunately, was not quite world-wide. The continent of Africa seems to have been affected only in its northern part. Indeed, the elephant became extinct in North Africa only after the time of Hannibal. Most of the fauna of Tanganyika and Kenya Colony is still comprised of Pleistocene animals. Most of the new forms are still there.

Southern Asia, especially the peninsulas of India and Malay, also escaped the mysterious end. The elephant and the rhinoceros, the lion and the tiger, are even today found in the jungles of Burma and Malay. Even South America seems to have escaped the full force of the avenging death.

The llama, the vicuña, and the alpaca are all present-day survivors of the early American camels. The South American sloth is a miniature counterpart of the great ground sloth of Pleistocene times. Casually taken, the mystery would seem to be a mystery of only the northern hemisphere. The south escaped. It must be remarked, however, that neither the mammoth nor the mastodon, nor any of the other larger forms of animals, survived even in the tropical portions of South America. A simple escape to warmer regions does not give us the whole answer.

Still other factors enter into the problem. If we envision the Grim Reaper of the animal world simply sweeping across the North American continent from Alaska to Florida and cutting down with his scythe all of the animals that populated those entire lands, we would be far from the truth. Although it has been estimated that forty million animals died at this time, not all of them were immediately obliterated. There is rather good evidence that one or two species lingered on after the rest had become extinct.

Just after the Folsom discovery, some Boy Scouts were investigating the crater of a small extinct volcano near Las Cruces, New Mexico. These intrepid youths lowered each other on a long rope into the carbon dioxide-filled bottom of the volcanic shaft. Under an overhanging ledge at the bottom of the crater, they found what they considered to be the somewhat flattened remains of a large brown bear. The Scouts hoisted the carcass to the surface to examine it. They were struck by an outstanding feature—the same salient

feature that caused Sandia Cave to be excavated. This long-haired bear had claws of colossal size, so large that it was obvious that he could never have walked flat on his paws but would have had to turn the claws under and walk on the back of his hands. The animal was, of course, a giant ground sloth, one of the typical animals of the Pleistocene, which supposedly became extinct at least ten thousand years ago. The Las Cruces sloth, however, discovered by these enterprising Scouts, was in as good condition as a cow that had died last year. The dried skin, the long yellow hair, and the desiccated ligaments were all in place. Even allowing for the dryness of the southwestern air, the sloth looked as though he had tumbled down the volcanic shaft and rolled under the ledge in his death agonies only a few centuries ago at the most.

The sloth claw from the Sandia Cave was found on top of the cave debris rather than underneath the sealing layer of the stalagmitic material. In certain areas, at least, it would appear that the giant ground sloth lingered on long after the usually regarded end of the Pleistocene Age.

Also in New Mexico, in a cave, there were discovered in the late 1930's additional evidences of the lingering of certain Pleistocene animals. This cave, located in the Guadalupe Mountains near the Texas line, is a narrow cleftlike crack in the limestone, typical of so many caverns in the region. The entrance is low and narrow, making it necessary for the investigator to crawl on hands and knees for several feet. Inside, however, the cave opens into a large

chamber with a floor several feet below the level of the entrance passageway. This large sunken room is almost filled with camel bones. These camels are not the present-day circus variety but rather the small, long-necked American camels of the Pleistocene period. The bones lie in profusion, perfectly preserved as though they had been piled there only a few years ago. The cave is redolent with the odor of dry dust and of the bats that hang in clusters from the ceiling. But even the extreme aridity could hardly account for the wonderful preservation of the camel remains. There is little or no accumulation on top of them. In the Abilene region of Texas, accumulations of silts on top of ancient deposits gave an indication of their comparative age. In Camel Cave, only a thin veneer of dust and bat guano covers the camel graveyard. They do not seem to be extremely ancient. From this evidence, as well as from similar signs in Gypsum Cave in Nevada, it would seem that the American camel also lingered on after death had overtaken the majority of his Pleistocene contemporaries. Not the least interesting aspect of Camel Cave is the question of how the camel bones got into the sunken cave chamber at the end of the passageway. Even Pleistocene camels did not usually crawl on their hands and knees into a small aperture in the face of a cliff.

In spite of the indications that a few animals escaped the tragedy, there is no doubt that the major portion of the great animals of the Pleistocene met their end at the same time. The mystery as to what killed them seems to have attracted some attention even among the American Indians.

Perhaps unconsciously the red men realized that there was something magically significant about the bones and remains that they found washing out of river banks and sand dunes. Many an Indian medicine bag, filled with odds and ends of nature, contained a fragment of mastodon tusk or a camel tooth as a further aid in securing the magical power that had once been held by these mystical animals. But from the day of the red men through the various decades of American science, the consuming mystery of the death of forty million Pleistocene animals still stands.

Several theories have been proffered to explain this tragedy. The first and most obvious of these was that the ice killed them. This explanation does not answer the most fundamental precepts of this very complete mystery. Any examination of the camping sites of the early hunters shows that the animals lived and the hunters killed them in and around and during the great glaciations. Animal remains may be found beneath evidences of Wisconsin ice. The moisture and rain which deluged the country as a direct result of the tremendous ice walls made possible the lush vegetation that supported the abundant animal life. There is no doubt that the Pleistocene ice did not, of itself, kill the Pleistocene animals. They flourished because of the ice.

"Why, then," the visitor at the museum answers with a knowing smile, "when the ice melted away the vegetation disappeared. When the vegetation died off, so did the animals. It's as simple as that."

Unfortunately this simplicity is deceptive. The desicca-

tion following the end of the great Glacial Age no doubt profoundly affected the lives of the animals. Mammoth, which reveled in browsing on the birches and alders in Pleistocene Kansas, found themselves reduced to sparse bunchgrass. Horses, camels, sloths, antelopes, all found **slim** pickings in their former habitat. But what was to prevent these animals from simply following the retreating ice to find just the type of vegetation and just the climate they desired? If Newport is cold in the winter, go to Florida. If Washington becomes too hot in the summer, go to Maine. These are not just social decisions, they are natural inclinations of the most fundamental sort. Why, then, do we **not** find mastodon and mammoth tramping the glades of the Yukon Valley today? The vegetation there and apparently the temperature and the generally drizzly conditions closely approximate the enviable Pleistocene times. Why didn't the horse survive? In some mountain valleys close to the shrunk remnants of the great Wisconsin ice tongues, why didn't the saber-toothed tiger make a go of it by retreating into the mountains where he could satiate his carnivorous appetite on animal remnants existing there? Why did they all die out? The answer to this question certainly cannot be alone "vegetation." The shrinking of the continental ice and the consequent climatic change might indeed cause a great shrinking in animal populations but not total extinction, certainly not of so many different species.

One of the most interesting of the theories of the Pleistocene end is that which explains this ancient tragedy

by world-wide, earth-shaking volcanic eruptions of catastrophic violence. This bizarre idea, queerly enough, has considerable support, especially in the Alaskan and Siberian regions. Interspersed in the muck depths and sometimes through the very piles of bones and tusks themselves are layers of volcanic ash. There is no doubt that coincidental with the end of the Pleistocene animals, at least in Alaska, there were volcanic eruptions of tremendous proportions. It stands to reason that animals whose flesh is still preserved must have been killed and buried quickly to be preserved at all. Bodies that die and lie on the surface soon disintegrate and the bones are scattered. A volcanic eruption would explain the end of the Alaskan animals all at one time, and in a manner that would satisfy the evidences there as we know them. The herds would be killed in their tracks either by the blanket of volcanic ash covering them and causing death by heat or suffocation or, indirectly, by the volcanic gases. Toxic clouds of gas from volcanic upheavals could well cause death on a gigantic scale. If every individual, old and young, were killed, extinction would naturally follow.

Throughout the Alaskan mucks, too, there is evidence of atmospheric disturbances of unparalleled violence. Mammoth and bison alike were torn and twisted as though by a cosmic hand in godly rage. In one place, we can find the foreleg and shoulder of a mammoth with portions of the flesh and the toenails and the hair still clinging to the blackened bones. Close by is the neck and skull of a bison with the vertebrae clinging together with tendons and ligaments

and the chitinous covering of the horns intact. There is no mark of a knife or cutting implement. The animals were simply torn apart and scattered over the landscape like things of straw and string, even though some of them weighed several tons. Mixed with the piles of bones are trees, also twisted and torn and piled in tangled groups; and the whole is covered with the fine sifting muck, then frozen solid.

Storms, too, accompany volcanic disturbances of the proportions indicated here. Differences in temperature and the influence of the cubic miles of ash and pumice thrown into the air by eruptions of this sort might well produce winds and blasts of inconceivable violence. If this is the explanation for the end of all this animal life, the Pleistocene period was terminated by a very exciting time, indeed.

In spite of the tempting ramifications of a volcanic end, we cannot account for the killing of all the Pleistocene life in this manner. In the southern regions, in Colorado, down into Texas, or in the peninsula of Florida the Pleistocene animals also died. In these regions, however, there is no evidence of a volcanic eruption or any sweeping disturbance such as we might envision for Alaska. The animals in the rest of the continent are now just as dead and as thoroughly extinct as their Alaskan relatives. Any good solution to a consuming mystery must answer all of the facts.

Even before the days of DDT, an ingenuous theory was advanced that all of the Pleistocene animals were killed by

parasites and disease. A Pleistocene tsetse fly was pulled out of the hat to account for this mass phenomenon. It was alleged that the tsetse fly had killed thousands of animals in Africa and could well have done so in ancient America. Hundreds of thousands of tsetse flies laying millions of eggs in the nostrils of the Pleistocene herds of early America might have strewn the landscape with the carcasses of Pleistocene life.

There is a certain fascination to an insect theory as there is to a volcanic explanation. Any picnic is disturbed by ants, and any person knows that insects are everywhere and their effects are unpredictable. The explanation hardly seems adequate, however, at least to dispose of all kinds of animals in all varieties of places and climates. What would have killed off the horse probably would not have affected the bison. If the mastodon succumbed, the mammoth would have survived. Even supposing invasion of several kinds of parasites, the supposition bears little weight when we think of the immensity of the Pleistocene world and the numbers of animals involved. Parasitic attacks on animal life usually involve a region or climate and certain kinds of animals. It would have to be a super-tsetse fly that would cause the extinction of both the bison herds of Alaska and the camel of Texas. There is no doubt that diseases play a large part in the lives of animals, but an unparalleled series of outstandingly toxic insects or parasites would be needed to account for this mass execution.

It must not be forgotten that the one major animal, man,

survived! Interwoven through all of this story is also the story of man. Anxious as we are to discover what happened to forty million mammals, we are even more anxious to learn the history of the man who actually stood there and saw them, perhaps even saw them in their death agonies.

As in the detective story, where the one clue to the whole solution was before our eyes from the very first, so it is perhaps with this mystery. The only single additional element that we are certain was new to this animal picture was man himself. The untold thousands of animals that we have described that ranged the continent from South America to Alaska, in the height of their glory were disturbed by only one puny carnivore: this fellow with the little flint-tipped spears in his hand.

Certainly we cannot say that these early American hunters killed off herds of animals numbering many thousands. It is absurd even to contemplate any such theory that man could have killed hundreds of thousands of mammoth and mastodon to such an extent that the animals could not survive. However, man was the only new element that we are certain was introduced into this Pleistocene picture of teeming life.

Dr. Carl O. Sauer, of the University of California, has recently advanced a theory that may solve this enigma. Dr. Sauer has concluded that man was responsible for the extinction of these many millions of animals and that the only question is to find out how he did it.

We may picture ourselves, if we can, divested of all the

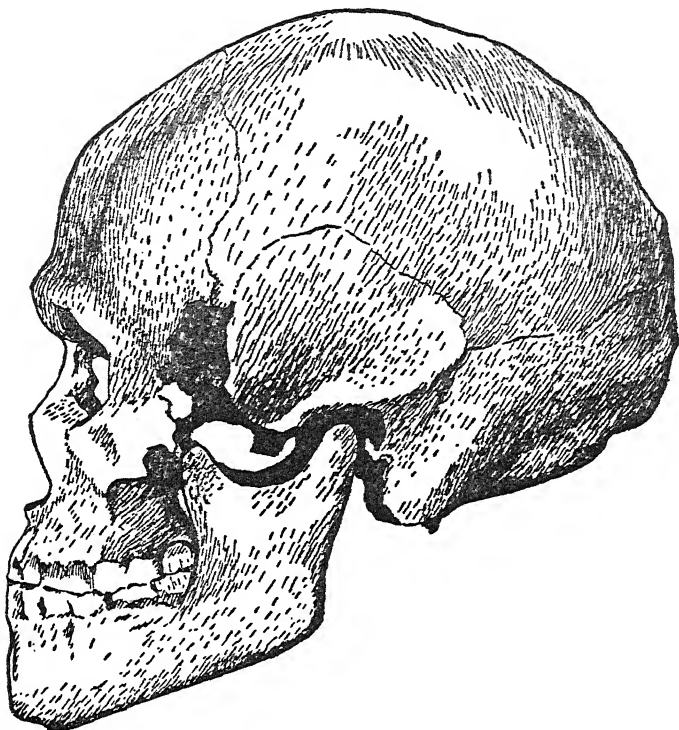
trappings of civilization, and armed only with these same small, inadequate flint-tipped spears of our early ancestors. If we were confronted with the problem of killing an elephant, how would we do it? We certainly would not rush up to a herd of mammoth brandishing their trunks and tusks high above our heads. That would be suicide. Rather we would use our human reasoning to encompass their destruction. Could we catch the mammoth in a pitfall? Could we drive him over a cliff? The latter would be far the easier, as we could certainly find a herd of these animals grazing near a cliff or an escarpment, over which we might stampede them; but how?

Man has one implement that no other animal has yet learned to use. Man knew it early, and the ashes and bits of charcoal that we have found among the bones of his camp sites at Folsom and in the Sandia Cave are ample evidence of his knowledge. This weapon was fire!

By setting fire to the prairie grasses and the dry stalks and bushes in the fall of the year, ancient man could, and undoubtedly did, cause the destruction of thousands of these animals. Whole herds at once, bulls, cows, and young, were forced over cliffs or into rivers and lakes where they could be dispatched at will. If we wish to make the picture complete, we may imagine the aroma of burning and singed flesh of a whole herd of mammoth driven over a cliff by encircling fire and piled up, smoking and dead, at the foot of the escarpment. Man was a waster as he always has been. He could eat only a small part of that which he had killed.

The fires, which he kindled to kill whole herds of horses and camels and elephants at one time, also burned off the vegetation upon which these same animals fed. So man, the greatest destroyer of all time, even though he was few in number and small in stature, may have encompassed the destruction of forty million animals.

The trial has not yet been held. Possibly we are not willing to accept the burden of reproach that would certainly be ours if we were to admit that our early ancestors killed off the Pleistocene animals. Millions of animals were killed, of that there is no doubt. Some hundreds of varieties of animals, mostly large ones, became extinct. That also is a fact. Who or what killed them is still a mystery.



CHAPTER 12

The Early Hunters Themselves

THE WHOLE STORY OF THE first Americans is not told with flint points and bison ribs. We want to know about the men themselves. What did these people look like? Were they primitive or modern? Were they beetle-browed and low-headed like the early Neanderthal of Europe? Would the face of a Sandia

woman frighten us if she emerged suddenly from the other side of a swinging door? And tumbling fast on the heels of these queries comes the inevitable question from the casual visitor to an excavation, "What happened to the early men?"

In the dank muck pits of Alaska, as we pulled each sodden bone from the black ooze, the question was always the same, "Is it a human bone?" In the dust of the Sandia Cave and in the dirt and debris of the Clovis beds we grasped eagerly for each bone fragment hoping that it might suggest by contour or texture that it came from a human body. Bones from the human skeleton can of course be recognized with certainty even though only small fragments remain. But search as we might amidst the litter that the ancient men had left behind them, we could find no piece of the men themselves. So far, on the actual camping places of Folsom, Sandia, or Yuma men not even a human front tooth has come to light. The Midland woman's skull helps some, but this early female was not a real Folsom person (as revealed by the lance points found with her), and did not shuffle off the mortal coil on a camping site so that we could be sure.

Any material found in caves or at camp sites is today, of course, even more important now that we have a method of dating remains quite accurately. We know when the Folsom and Sandia hunters, and other early Americans, lived and died at these spots. The dating of these ancient fragments of American history is a by-product of the Atomic Age.

During World War II, as a part of the research for the

atomic bomb, and even before the war, scientists were working on radioactive substances. Among other things, they discovered that a radioactive form of carbon existed in all living things. Those in the know called this stuff carbon 14.

We, of this modern age, are very conscious of radioactivity. We know that radioactive substances constantly throw off particles of themselves in the form of tiny rays which dart furiously about in the close vicinity of a piece of radioactive stuff. Intense radioactivity can be vicious and actually kill. Carbon 14 is not so lethal, which is a happy circumstance because we all have small bits of this form of carbon in our bodies.

All radioactive materials are measured by scientists according to their half-life. In simple terms, the half-life is the time required for a piece of radioactive material to disintegrate by fifty per cent in the process of showering its surroundings with small particles of itself. The half-life of carbon 14 is 5,568 years plus or minus a small error of measurement. That is to say that in this time, a pound of carbon 14 would disintegrate to half a pound. In another 5,568 years, the half pound would diminish to a quarter pound, and so on. No matter how thin you slice it, it is still carbon 14.

The dating scheme using carbon 14 works in this way. The very slightly radioactive carbon 14 substance is formed in the upper atmosphere, probably by the action of cosmic rays. All living things on this planet, animals and plants alike, absorb carbon 14. Because carbon 14 is radio-

active, it is disintegrating at the same time at a fixed rate. However, when a person dies, when a mammoth is killed, or when a tree is cut down, these living things cease absorbing carbon 14. The radioactive carbon 14 in their bodies or in the wood of the tree continues to disintegrate at a fixed rate.

Dr. W. F. Libby first began to work out techniques of measuring the minute quantities of carbon 14 in the wood of an Egyptian mummy case, in a sodden splinter from a frozen piece of driftwood of the Ice Age, and from the tusks of a Pleistocene elephant. Checking at first with once-living things of known date, such as the remains of the Egyptian pharaohs, the carbon 14 method of archaeological time-telling was perfected. The greatest difficulty lay, not in detecting the carbon 14, but in measuring the exact amount so that a date could be ascertained. Several laboratories have now been set up in the United States to measure ever more exactly the carbon radioactivity of fragments of archaeological refuse which are brought in.

Thus, now, these scientific places can determine almost exactly when a piece of charcoal dug from an ancient cooking fire was living wood and part of a tree that grew in Ice Age America. A piece of a tooth of some Ice Age animal shows exactly, by this dating method, when the animal was alive. Most important, the archaeologists wanted to know the life and times of the earliest Americans. Had our first guesses based upon vague geological happenings been correct?

A carbon 14 date derived from a fragment of a mammoth

tusk from the Sandia Cave showed that that particular mammoth had been killed by a Sandia spearman and the tusk brought back to the cave about 26,000 years ago. Numerous carbon 14 samplings from Folsom camping sites showed that the Folsom men were hunting bison in what are now the western plains of the United States about 9,500 years ago. The dates of the Yuma hunters in the carbon 14 calendar were some 2,000 years later than Folsom man. The earlier time estimates, then, had been remarkably accurate.

The last major movements of the Ice Age had occurred some 8,000 years before our time. By projecting these early events only slightly more into the past, we now can say that the first Americans came across the Bering Strait about 30,000 years ago. Nevertheless the perplexing lack of any human bones amidst the piles of material left behind by these first Americans is most unusual and unfortunate. In early sites in Europe and in Asia, for example, human remains are common. These may be either the results of purposeful burials, where the dead were interred on a convenient refuse heap, or of casual scatterings of human remains swept out with the other debris. Practically no camp site, either ancient or semimodern, is without some evidence of the physical humans who lived there. In extremely primitive cultures in the Old World, man was as careless about the remains of his dead contemporaries as he was about the bones of the animals he hunted. Is it too much to ask that some forgotten Sandia fellow should have crawled into a back recess of the Sandia Cave and have died there?

Would we not expect that some ancient hunter, grievously wounded in the chase, should have been dragged back to the cave by his companions and buried there? Certainly we would expect some such fortuitous occurrence to have placed in our hands the actual physical skeleton of a Folsom or a Sandia man. The absence of any human remains appears almost more than pure accident. When season after season of excavation had produced not a single human specimen, we began to search for some method by which the early hunters had disposed of their dead so as to leave no trace.

"But," answers the brilliant young student in the first row, "they cremated their dead so that the ashes left no trace." This might appear to be a logical explanation were it not for two outstanding difficulties. The first is that, from our knowledge of human cultures, the practice of cremation is an advanced cultural trait, associated with only highly evolved civilizations. Primitive hunting cultures such as those of the earliest Americans usually practiced simple interment. Another difficulty is that, even had the Folsom men cremated their dead, we would find fragments of the burned and charred bones. Cremated burials are not at all unusual in Bronze Age European sites or among the Mound Builders of the Mississippi Valley. These cremated remains are easily identified by a double handful or so of charred bones. We have never found the smallest fragment of a burned human bone even at the Lindenmeier Folsom site, where the remains were screened most carefully.

It seems improbable that very many of the Folsom and Sandia hunters died a natural death in the midst of the

dangers of the Pleistocene animal world. We can postulate many an ancient tragedy, as a herd of skittish bison stampeding the wrong way and trampling to death some unlucky hunter. We need no imagination to picture what would happen to a Sandia spearman if he let the flailing trunk and tusks of a mammoth get too close to him. Even mounted men with modern rifles would find hunting dangerous amidst such animal herds as these. One can easily picture the perils of this life to men on foot, armed only with puny spears.

In such a hunting way of life, and an extremely perilous one at that, the natural explanation is that Folsom and Sandia people let their dead lie where they fell, trampled into the mud by an angry elephant or gored by a wounded bison. Even with such a haphazard disposition of the dead, we should have found at least one burial purposefully made and with enough evidence with it or around it so that we could say with certainty, "There lies a Sandia or a Folsom man." It is as exasperating as it is mysterious that so far this has been denied us.

In spite of the fact that we have never found a skeleton which we can definitely say is that of one of the earliest Americans, we do have some information about them. There seems no reason to doubt that the modern American Indian, as we know him today, is the descendant, directly or indirectly, of the earliest immigrants to the New World. We have considerable evidence that these tenacious human ancestors of ours survived the obliterating holocaust at the end of the Pleistocene. The great mammals of their era died

off. Man somehow, with reason, ingenuity, and adaptability as weapons, lingered on to become the dominant life of the modern era.

The Sandia and the Folsom men represent two waves of human migration into the New World from northeastern Asia. They are the earliest newcomers into these continents of whom we have any record. Undoubtedly other later tricklings of human beings made their way over from Asia by the same route as had the Sandia and Folsom men. We have already shown how complex the modern Indian is. The earliest Europeans were struck by the multiplicity of languages, customs, and physical types among the American red men. Sandia and Folsom men and women were the true ancestors of the American Indians. Later movements of hunters from the Asiatic motherland, coming at later times when changes had taken place in Asia, added new complexities and differences in their turn. Some of these post-Folsom movements of human beings across Alaska and down through Canada represented humans moving from the interior of what is now Mongolia and Siberia, where many of the Asiatic peoples of the present day were also being developed. The modern Mongols and the northern Chinese stemmed from early hunting ancestors in these same Asiatic regions. Many of the American Indian tribes look Chinese or Asiatic for this reason. Although they did not spring from the Chinese, the American Indians are extremely distant cousins whose roots go back into the same antiquity.

Unfortunately, our ordinary ideas of the American In-

dian are erroneous. Usually we think of the red man in terms of his portrait on one side of a buffalo nickel. This is only one kind of Indian, peculiar to the Plains area of North America. There are, scattered throughout the North and South American continents, a variety of native American Indians which encompasses practically every form of stature and build and a very considerable variation in skin color. Among native American Indian tribes there are tall Indians and squat Indians. There are the almost black primitives of the Amazon Basin and the extremely lightly pigmented natives of southern Canada. The American Indian exhibits such a disparity of physical form that it would seem impossible to gain any information from this source. However, a very special scientific technique was called into play to try to ferret out this information from the American Indian as we know him today.

Scientists, over the past twenty years, have visited practically all of the American Indian tribes in both North and South America. Numbers of these Indians they subjected, when they could be persuaded to submit, to a series of tests. These assiduous scientists measured the Indians' heads with calipers, and the various proportions of their bodies with tape measures. They even took small samples of blood from the natives who would allow them to do so. The results of all this seemingly aimless scientific experimentation are extremely revealing, even though the process of measuring and describing the American Indian has hardly begun.

When this data had been gathered so as to produce something like a comprehensive whole, a certain pattern began

to emerge. Even though the American Indian ran the whole gamut of physical form, certain areas were found to be homogeneous as regards stature, head form, and the like. Of all the observations that the scientists made upon the American Indian, the shape of the head, as viewed from the top, was taken to be the most significant. Viewing them thus, the scientists found that there were long-headed Indians and round-headed Indians, and that the round-heads and long-heads could be divided into geographical distribution patterns as well as into a certain chronological sequence.

By carefully plotting the long-headed Indians on a map, it developed that these aborigines were to be found on the extreme edges of the New World continents. For example, at the extreme southern tip of South America, in Tierra del Fuego, some of these long-headed Indians had survived until the present day in an extremely primitive status of culture.

In contrast, the round-heads seemed to occupy generally the central portions of North and South America. Although this is but one physical measurement among many, it has been postulated that the long-heads represent the head form of the earliest immigrants to these shores. These original long-heads were followed later by peoples with medium head breadth, and by actual round-heads in several waves. These later round-headed people presumably overawed their long-headed predecessors and pushed the latter into the fringes of the New World, where a few of them have survived until the present day.

If we were to rely entirely upon the distribution of the long-headed and round-headed Indians for this informa-

tion, we would be on uncertain ground indeed. We have found other evidences that bear out our contention of several migrations of peoples successively represented by varying head forms. Several human skeletons have actually been found in various parts of the New World under very suggestive circumstances.

A South American skull that helps to light up this darkened corner of human knowledge was found at Punin in Ecuador. Unfortunately the Punin man did not clutch in his bony hands any Sandia or Folsom points nor were there any implements at all associated with the find. However, the disposition of the skeleton was the same as that of several animal bones of extinct varieties. The Punin discovery gave great promise of being the actual skeleton of one of the earliest Americans; but the proof is a little doubtful. We are not quite sure whether this collection of bones represents some adventurous Sandia man who had found his way down across the Isthmus of Panama and into the area which is now Ecuador. We are not surprised to find, however, that the Punin skull is long and narrow like the other early candidates.

Not all of the narrow-headed skeletons are confined to South America by any means. In the deep-cut arroyo banks of the streams and rivers near Abilene, Texas, have been found several skeletons that seem to indicate a very great antiquity. Unfortunately, none of these burials or depositions is associated with the very earliest Abilene points of the first Texans. The Texas series does seem to be ancient, however, although it is a moot question at the present time

as to just how ancient it is. The most interesting thing about this Texas series of skeletal men is that their heads are remarkably long and narrow.

Perhaps the most discussed find of all the many skeletons found in the New World is that of Minnesota man. Actually this skeleton is that of a woman and is now known to students as "Minnesota Minnie." These human remains, as practically all the others we have mentioned, were found accidentally during construction work. It seems that gravel pits and remains of early man have been most intimately connected since that first wet day, so long ago, when Boucher de Perthes searched the gravel pits of northern France for fist axes. The Minnesota woman, or rather girl, came to light as a road crew was digging through a stratified clay and gravel deposit. This was no ordinary deposit. The layers and bands of clay and sand in which the girl's skeleton was found were collections of debris formed in and around a great glacial lake, long since disappeared. Geologists have so well described this body of water and its life history as being formed at the end of the Wisconsin glaciation that they have actually given it a name—Lake Pelican. The Minnesota woman seems to have fallen through a hole in the ice and to have sunk, sodden and drowned, to the frigid depths of ancient Lake Pelican. There she was, gradually covered by the sifting sediments of the glacier-fed water, to be revealed only when a road crew accidentally dug across her casual grave. Unfortunately, some scientists, after viewing the last resting place of Minnesota Minnie, express the opinion that she might have been buried

there by later-day Indians, long after glacial Lake Pelican had disappeared. Unfortunately, too, the few baubles found with this ancient girl give us practically no information as to her affiliations. An elk-antler dagger, a conch-shell ornament, and another shell seemed to be her only possessions, as though she had carried these trivia in a bag when she sank to her death. If only she had had a Sandia point with her in her grave, or, at the very least, a mammoth bone in the crook of her arm. From her disposition and the possessions with her, we are not absolutely certain that this bony skull is that of one of the early hunters whose fortunes we have been following.

If there is any uncertainty about the Minnesota skull as to time, there is none as to contour. This girl's head was satisfyingly long and narrow. Added to this was a very pronounced bulging in the region of the teeth and mouth. The teeth themselves are of tremendous size. Even the front teeth of this young lady of antiquity would do credit to a horse. With her dished-out mouth and exaggerated incisors, Minnesota Minnie was certainly no beauty. Beauty or not, however, she demonstrates again the long-headed strain that we have come to expect as associated with early men.

Other skeletons have turned up in other parts of the Americas as candidates for the honor of being the first authenticated remains of the earliest hunters to be found. Two other skulls have been discovered in the region of Minnesota under very suggestive circumstances. A skeleton was found deep in the shifting sediments of the Mississippi

River delta near New Orleans. Human bones have been found in Florida in the same strata as those containing the shattered remnants of the mammoth and his other Pleistocene contemporaries. A skull was found deep in a mine in Calaveras County in California which caused considerable scientific excitement several decades ago. In the last few years other human remains have turned up in Minas Geraes, Brazil, and also in some caves in Tierra del Fuego. A human skeleton was discovered in the banks of the Cimarron River in New Mexico only a few miles from the original Folsom site. Indeed, there is a plethora of skeletal material which has been attributed to these early horizons.

With the possible exception of the Midland woman and Minnesota Minnie, however, none of these human remains satisfy our rigid requirements. We cannot be absolutely certain that, as we hold any one of these skulls in our hands, we are actually looking into the bony face of a Folsom or Sandia man. We probably have, among all of the skeletons that have been offered as candidates for this honor, one or more authentic remains of our earliest Americans. We probably have found a Folsom and a Sandia man too, and don't know it. The human bones must be accompanied by some of the typical flint implements made by early man for us to be absolutely certain of their identity.

We had hoped, of course, to find a Folsom or Sandia man in the Alaska muck pits. Day after day, as we tramped and searched the dank muck banks and sluice runs, we talked excitedly of finding human remains amidst the tremendous panoply of animal bones that we constantly pulled from

the mud. We even visualized finding the entire carcass of a Sandia hunter frozen solid in the Pleistocene stuff, preserved in every detail, just as we had found parts of mammoth preserved in these same frozen deposits. Grisly as it might seem, we argued as we searched the muck pits, we would be satisfied with a human skeleton with only a few of the tendons and ligaments preserved. As a matter of fact, we would have been satisfied with any fragment of human origin at all. But we found not a trace; not so much as a splinter of human bone.

The flint points that we found beneath the Alaskan mucks are indubitable proof that humans were there. These humans themselves must lie somewhere concealed beneath the frozen muck blanket. Some day we shall find them, weathering out on the banks of the Tanana or cropping out on some tributary of the Yukon—the mortal remains of one of those first hunters.

We know, approximately, what these men will look like when we find them. We are certain that they will be narrow-headed and probably somewhat dish-faced with big teeth. We know that these earliest Americans were modern men when they first straggled up the Yukon Valley. Thirty thousand years ago, when these first immigrants arrived, was comparatively late as the chronology of the motherland of Asia and Europe goes. The human animal had already developed from the primitive, bony, beetle-browed beginnings of the Neanderthal type to humans of essentially modern contour. The development of man had already taken place in the hinterland of Asia before he

crossed the Bering Strait into these new continents. It is not likely that we shall ever find Neanderthal man here.

The men whose tools we first found at Folsom and whose campfires we discovered in the Sandia Cave were modern men like ourselves. If we met any of these earliest Americans on the street, and they were dressed in the height of modern fashion, we probably would not give them a second glance. They might have been a little ugly by modern standards, but certainly no worse than some individuals we see today. We know they were essentially modern-looking people, and we know they were narrow-headed; but we still would like to see one face to face. Our greatest desire is to discover the bony skeleton of one of these ancient people under circumstances such that the proof will be indubitable that we are actually examining one of the first Americans. We will certainly find one soon.

One of the traders in Alaska told us that he had seen the muck deposits on the Siberian side of the Bering Strait. There were frozen banks a hundred feet high, where mammoth tusks and bones and flesh and hair protruded as the weak arctic sun melted back the faces of the mud cliffs. The traders said that there were human remains in these Siberian mucks. Some day, when circumstances permit, we hope to get to northeastern Siberia. There we will follow the courses of the rivers that cut down through the ancient Pleistocene levels. There, I hope, we will find the earliest Americans themselves when they were still Asiatics. The story must be there.

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